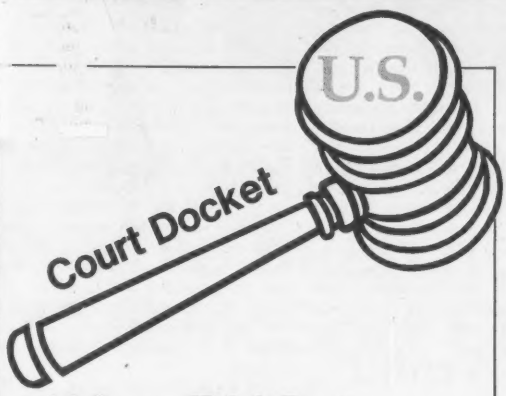
# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER




## • U.S. vs. IBM Rests

**By Bob Johnson**
CW New York Bureau

NEW YORK — IBM and the Justice Department last week rested their cases in the 12-year-old U.S. vs. IBM antitrust suit.

At the same time, IBM lead attorney Thomas D. Barr accepted the court's previous offer to help settle the case and asked for a meeting with U.S. Assistant Attorney General William F. Baxter.

Judge David N. Edelstein set a June 10 date for a meeting between the two sides and invited Baxter to attend. "At this juncture of a possible meeting, I would like to indicate that my offer to do anything and everything I possibly can to bring this case to an amicable disposition stands in the fullest measure," Edelstein said.

While both sides have now rested their cases, the trial

(Continued on Page 4)

## • AT&T Ruling Overturned

**By Phil Hirsch**
CW Washington Bureau

NEW YORK — A federal district court's 1980 verdict finding AT&T guilty of violating the Sherman Antitrust Act was overturned here late last month by the U.S. circuit court of appeals.

Although the case will now go to the U.S. Supreme Court for a final ruling, it could impact the Justice Department's antitrust suit against the phone company. Several private suits are also pending.

Last month's decision reversed a $16.5 million treble-damage award won early last year by Northeastern Telephone Co., an interconnect supplier. The appeals court found that:

• "Metaphorically, Northeastern was a mosquito challenging an elephant . . . But similar size disadvantages

(Continued on Page 2)

## • AT&T to Ask Dismissal

**By Phil Hirsch**
CW Washington Bureau

WASHINGTON, D.C. — AT&T will ask for dismissal of the government's antitrust charges against it early next month when the Justice Department winds up its case.

Judge Harold H. Greene, who is presiding over the U.S. vs. AT&T case, indicated last month that he will rule on the request soon after it is made. To expedite the ruling, he asked the Justice Department to reply to AT&T's motion before Aug. 17, the date government attorneys originally proposed for resting their case.

Recent testimony in the "trial of the century" has revolved around allegations that Bell unfairly discriminated against outside suppliers in evaluating their equipment against Western Electric offerings.

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# Burroughs Offering Users 'Buy-Back' Deals on B800s

**By Tim Scannell**
CW Staff

Burroughs Corp. is reportedly "buying back" allegedly defective B800 computers from select users, sometimes at their full purchase cost, and supplying them with new B900 systems at a considerable discount.

The B800 is the focus of close to 200 suits filed by disgruntled users that claim their systems never performed as promised.

A number of dissatisfied users have been offered "substantial to very substantial" discounts to trade their B800s for B900s in the past few months, according to a Burroughs spokesman.

The discounting arrangements, which consist of varying trade-in allowances for the B800, are being offered by at least one Burroughs regional vice-president in certain areas of the western U.S.

While Burroughs admits that the trade-in deals have been going on for some time, the company declined to say exactly how many users have been contacted or if the firm's other three regional vice-presidents are involved in the actions.

### Individual Basis

The trade-ins are being negotiated on an individual basis, not offered as a blanket solution to problems allegedly surrounding the B800 systems, the Burroughs spokesman maintained.

The trade-in allowance given for the B800 processors and the rest of the system equipment "vary from system to system and user to user," he added.

Reportedly none of the firms involved in the swaps had filed suit against the computer vendor.

While Burroughs has been keeping details of the sys-

(Continued on Page 8)

# DP Seen Taking Rap In Corporate Blunders

**By Ann Dooley**
CW Staff

NEW YORK — The data processing manager is in danger of becoming the fall guy for any failure in an organization — and he frequently walks right into the trap.

The DP function is an easy target when top management is assessing blame for a failure in meeting service objectives, according to Barry Stevens, principal consultant with Performance Management Associates of Phoenix.

In the eyes of top management, when user needs are not met, the user is not at fault — it is the fault of the DP department, Stevens said.

### User Utility

Speaking at a Capacity Management Forum here last week sponsored by Boole & Babbage, Inc.'s Educational Service, Stevens told a group comprised mostly of mid- and top-line DP and management information systems (MIS) managers that the data processing function is evolving into a utility with the sole purpose of meeting user needs.

DP could become merely a function to meet new growth and applications but, he warned, have no input into the decision-making process. Some departments are too close to that already, he said.

Because DP is not in on the planning and frequently has no knowledge of upcoming plans until it is too late to meet the user's objectives, the odds are stacked against DP, Stevens stated. This places many MIS managers in a vicious circle, according to Stevens. It works like this: top management assigns new tasks to the department, which cannot meet them be-

(Continued on Page 4)

## Two Fujitsu CPUs Enter 'Largest System' Sweeps

**By Marcia Blumenthal**
CW Staff

TOKYO — Entering the sweepstakes for the world's largest general-purpose computer, Fujitsu Ltd. unveiled two major new systems here late last month, the largest of which features 128M bytes of main storage.

Although the two new systems will not be available to U.S. users, at least one U.S. IBM plug-compatible maker was intrigued by the processors because they appear to incorporate very large-scale integrated circuits and feature a double buffer.

The smaller of the two systems, the Facom M-380, is a uniprocessor offering between 16M bytes and 64M bytes of main storage, a maximum of 64 channels and throughput of 96M byte/sec.

The larger system is the Fa-

(Continued on Page 6)

# Researcher: Big Net Users Fear Deregulation of Bell

**By Phil Hirsch**
CW Washington Bureau

WASHINGTON, D.C. — Companies with big telecommunications networks do not want the Bell System deregulated.

ICA coverage continues on Page 5 and Pages 10-13.

Reason: The companies fear the formation of one or more deregulated AT&T subsidiaries will lead to dispersal of responsibility, delays in processing of service orders and poorer quality maintenance, according to Susan Gordon, director of telecommunications policy research for The Research Board, Inc., a New York City-based consulting organization. Gordon spoke at the International Communications Association's (ICA) annual meeting here last week.

"A very real question is

(Continued on Page 10)

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## *More Than $100,000 Stolen*

# CPU Programmed to Hide Theft

By Bill Laberis
CW Staff

SHREVEPORT, La. — A former programmer is behind bars after admitting he stole more than $100,000 in money orders from a minicomputer system he had programmed for his own illicit ends.

Michael Murray, 30, is being held without bail while he awaits formal sentencing. He could receive up to 10 years in state prison and a $3,000 fine for the computer-assisted heist from National Bonded Money Orders here.

Murray began writing applications programs for National Bonded's new Datapoint Corp. 5500 system last August. At the time, he was an employee of Digital Electronic Services, Inc., a systems house from which National Bonded had bought the packaged system.

National Bonded's office manager, Bobby Marrs, said Digital Electronic Services fired Murray shortly after the applications programs were completed. Murray, a personal friend of Marrs, was then retained by National Bonded to "help work some of the remaining bugs out of the system," Marrs said.

According to Murray's testimony and a recent investigation by the district attorney's office of Caddo Parish, Murray began tinkering with the program so that checks he wrote to fictitious people and cashed himself were ignored by the system after the canceled checks were returned.

"He was in on writing the programs from the very beginning, and being a friend I trusted him completely," Marrs said. "He knew the business from top to bottom and just altered the software so that he could do his own thing. And believe me, he did his own thing."

### Losses Noticed

Early this spring, the company reportedly began to notice inordinately large paper losses and summoned an auditor to investigate the situation. On May 7, during the investigation, the company was burglarized; the computer printout records and check code numbers were stolen, the firm said.

A probe of the break-in revealed that more than 1,000 money orders had been stolen throughout the preceding months and that the system was programmed not to reveal the losses. The investigative trail reportedly led to Murray, who in turn led police to the evidence lifted in the burglary.

"We know he was using some of the stolen checks to pay off his Visa charge card, among other things," said Assistant District Attorney Robert Gillespie. Those "other things" may have included gambling debts as well as investments in a satellite communications capture dish company in which Murray had interests, sources close to the investigation said.

"At any rate, it is clear to us that his intent in going into the place was to manipulate the computer so that it would not show up the theft," Gillespie said. He added that state Judge Eugene Bryson has the option of handing Murray a suspended sentence in return for demanding that full restitution be made to National Bonded, which is not insured for the loss.

# Court Overturns AT&T Verdict

*(Continued from Page 1)*

face any aspiring entrant wishing to dislodge a dominant firm. The antitrust laws assume these risks and Northeastern must be taken to have accepted them."

• "Northeastern has not [cited] any unequivocal evidence of [Bell's] specific intent to monopolize ... Instead, it points to documents circulated among the corporations of the Bell system and to testimony of Bell employees. These show only that appellants wanted to win the competitive struggle. This desire, without more, is not unlawful.

The ruling relied heavily on the same court's 1979 decision in an antitrust case involving Berkey Photo and Eastman Kodak Co. In that case, the court found that "dominant firms, having lawfully acquired monopoly power, must be allowed to engage in the rough-and-tumble of competition.

"To oversimplify somewhat, the question is whether appellants did no more than to engage in vigorous competition, or instead, attempted to subvert the competitive process by unfair or unreasonable means."

The U.S. district court in its 1980 decision upheld six of Northeastern Telephone's antitrust charges against AT&T. Five of these were cancelled by the appeals court. The remaining charge — that AT&T "intentionally designed the protective coupler" for customer-provided equipment "in an unreasonable manner" — was remanded back to the district court for further proceedings.

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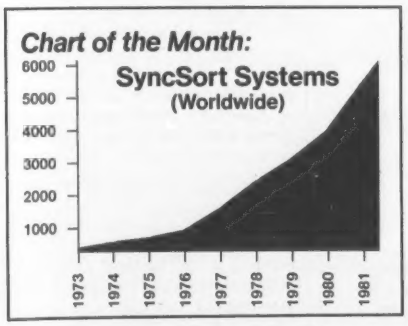
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# Postal Service Delays Nine-Digit Zip

WASHINGTON, D.C. — The nine-digit Zip Code is on hold.

The U.S. Postal Service said recently it will delay implementation of the program several weeks while it gathers additional information on the plan requested by the White House.

The decision reverses USPS' plan to begin releasing after June 1 computer tapes of the Zip Code data base to companies wanting to convert their files to the longer numbers.

The delayed implementation was announced in a May 27 letter to the House Government Operations Subcommittee on Government Information and Individual Rights, which has long sought more data on the USPS cost/benefit analysis of the new Zip Code program.

Largely as a result of prodding from Subcommittee Chairman Rep. Glenn English (D-Okla.), the Office of Management and Budget (OMB) has requested the additional information from Postmaster General William F. Bolger.

### OMB Approval

OMB also indicated the Postal Service should not finalize its plans until the information has been received and approved by the budget agency [CW, June 1].

In the letter to English, Bolger said, "We will delay release of the conversion tapes until June 22 in order that OMB shall have ample opportunity to review the requested data."

Subcommittee hearings on the proposal have also been postponed pending receipt of the additional information.

# DP Seen Taking Rap for Corporate Blunders

(Continued from Page 1)

cause of lack of preparation time, and the resulting poor performance causes management to exclude DP from the next decision-making process.

The secret to breaking out of this circle, Stevens told his audience, is to stop worrying. Instead of running around trying to meet every impossible task, Stevens advised the group to inform management and users what the problems and results will be — and then make sure they happen.

If user objectives are not met and the DP manager has already indicated they were impossible, management will make sure that DP has enough resources to meet the objectives the next time, he said. However, if a DP manager goes all out trying to meet objectives and falls short of the mark, management will simply view it as poor performance on the part of the DP function, Stevens claimed.

To measure effectiveness, planned performance should be compared to the actual performance at all the service levels, Stevens said. Capacity planning is the link that ties the firm together. It is difficult to show the cost/benefit improvements in DP so the department should concentrate on something tangible like system performance, he advised.

The DP department usually has to work in a reactive environment. It is dependent on the work load of other units within the organization, and their planning will indicate what the DP department's plan will be in relation to their needs, he said.

### Some Danger

Capacity planning can help top management by providing it with current performance and work-load capacity within the DP department. However, it is sometimes dangerous to make the service level too good, Stevens warned the audience. Because the DP department spends most of its time "fighting fires," ambitious service levels may not be met, and then top management will view the DP function as unresponsive and underachieving.

For effective capacity planning, a manager must examine a number of resources such as the time involved, the number of people needed, how much hardware and software utilities will be needed, the performance levels and the cost ratio, Stevens said. Reliability and accuracy also need to be taken into consideration when measuring or planning for performance objectives, he stated.

To meet these capacity planning goals, the key objectives in data processing include performance definition, service agreement, work-load tracking and reporting, problem resolution and cost accounting.

### Performance Definitions

Performance definition encompasses total performance, analysis procedures, internal performance requirements and user service agreements. The most important thing to remember, according to Stevens, is to get everything down on paper in order to avoid misunderstandings down the line. Work-load tracking and reporting includes defining a work center and work units, data collection and reporting and the various reports on service levels, work volume, resource use, trends and work unit times.

Problem resolution includes agreeing on what the problem is or may be, assigning accountability in order to avoid finding blame, installing a predefined procedure and conducting impact analysis procedures, Stevens said.

# U.S. and IBM Rest Cases

(Continued from Page 1)

is apparently far from over. Edelstein repeated his timetable for additional submissions, post-trial briefs, responses and post-trial motions. An Oct. 1 date was set for additional submissions; Dec. 1 was set for responses to submissions of opposing parties.

In the event that no settlement is reached, Edelstein set Dec. 29 as the return date for any post-trial motions and Jan. 5, 1982 for arguments on those motions. Jan. 6-9 will be the summation period, with each side having two days.

Barr's reasons for wanting to meet with the assistant attorney general stem from two recent 2nd U.S. Circuit Court of Appeals decisions involving the Northeastern Telephone Co. vs. AT&T case and the Berkey Photo vs. Eastman Kodak Co. case (story on Page 1). The IBM attorney claimed that reversed jury decisions concerning cost and pricing practices in favor of the defendants are comparable to issues in his case, adding that these decisions will have a "devastating effect on the government's case."

### Impact Analyzed

A memorandum analyzing the impact of the appellate court's decisions was sent to Baxter, Barr told Edelstein. In a cover letter attached to the memorandum, Barr said he hoped the attorney general would recognize that the appellate court's opinions "close the ring on the government's practice case here."

He added, "unless Berkey and Northeastern Telephone are reversed, it is simply not possible for the plaintiff (the Justice Department) to have any legitimate expectation that it will prevail on at least most of its practice claims."

When asked why he thinks IBM is now accepting the court's help for a settlement, lead government counsel Robert Staal said he believes IBM is making a "grandstand play and is trying to put public pressure on the government."

Staal added that he had relayed the judge's invitation to Baxter in Washington, D.C. A Justice Department spokesman reportedly said that Baxter is still reviewing the IBM case, but did not indicate whether he would attend the June 10 meeting.

Commenting on what he thinks Baxter will do in light of the requested meeting, Barr said, "Baxter is a strong man. I'm an optimist."


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# AT&T Cuts Wats Rate Hike Request to 10.5%

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T will not need a 16% increase in Wide-Area Telecommunications Service (Wats) rates after all; 10.5% will be enough, at least for now, the company said last week.

However, AT&T also said it may ask for further increases next October. Those hikes will come in private-line and Message Toll Service (MTS) dial-up long-distance telephone rates as well as Wats and will bring the company's earnings ratio up to the 12.75% level recently authorized by the Federal Communications Commission (FCC).

As things stand now, Bell explained, it will earn a 12.72% annual rate of return if all the recently authorized and currently proposed increases are implemented.

The authorized increases include a 16.4% hike in private-line rates last month [CW, May 18]; a revised Wats tariff, based on tapered rates and discounts for off-peak usage, effective the first of this month [CW, May 25]; and a general rate increase scheduled to become effective by July 9. The general rate increase originally consisted of a 16% increase in private line, MTS and Wats, but it has now been altered to a 10.5% hike for Wats and 16% for each of the other two services.

It has not been possible to set rates precisely at the level needed to achieve an overall 12.75% rate of return, AT&T Assistant Vice-President William R. Stump said in a letter to the FCC. Also, private-line rates "are already subject to two increases (16.4% and 16%) totaling 35% on a compounded basis. Moreover, many private-line users have recently experienced substantial additional increases resulting from the termination of Telpak on May 7. Accordingly, to the extent further increases in private-line rates may be necessary . . . it is appropriate to defer them to the October time frame."

Stump indicated that MTS rates will be raised at the same time, since even with the 16% increase proposed in the general rate increase , MTS earnings will not produce a 12.75% rate of return.

While the projected increase in Wats rates could push that service's earnings above the 12.75% ceiling, there could be some offsetting reductions as a result of changes in Wats that became effective this month.

One change — rate discounts of up to 65% on Wats calls made during nonbusiness hours — "provides users with an opportunity to reduce their charges significantly," Stump said. Also, because of a related FCC order, AT&T is now required to allow sharing and resale of Wats circuits. The result, Stump indicated, could be a reduction of Wats earnings below the 12.75% ceiling, in which case another rate hike for this service, as well as for MTS and private-line offerings, will be filed in October.

## *Users Blast Rate Hikes*

By Bruce Hoard
CW Staff

WASHINGTON, D.C. — AT&T's latest round of rate increases was called everything from "expensive" to "immoral" by users interviewed at the 34th annual conference of the International Communications Association (ICA) here last week.

AT&T is now asking for increases of 16% each in Message Toll Service and private-line rates and 10.2% in Wide Area Telecommunications System (Wats) rates.

Jerry Marcone, telecommunications manager for Crum and Forster, was part of a solid majority on the issue. "Quite frankly, I think it's too high," he said of the hikes. "There's too much hitting us at once. A gradual increase would be OK, but this is bad."

Bob Elmiger, manager of communications services for the Monsanto Co., also expressed his displeasure. "I obviously don't like them," he declared. "But you do what you can. The FCC (Federal Communications Commission) blew it, frankly."

Consultant Eric Wendel was the only person interviewed who thought Bell's move might be helpful. "It's good for the consulting business because it confuses people that much more,and it creates more competition in interconnect."

Martin Sidwell, director of Network Services for National CSS, Inc., was succinct: "I don't like it, but I guess it doesn't suprise me."

Fred Stodolak, manager of Computer and Telecommunications Services at Eltra Corp., screwed up a sour face when asked about the higher telephone rates. "It stinks. How are you going to prepare your budget for 1982?"

"It's the most absurd thing I've ever seen," Wayne Geoffrion said. The telecommunications specialist for Standard Oil of Ohio continued, "I don't see any value added."

Bob Stoutenburgh, director of Communications for the Sheraton Corp., labeled the hikes "immoral. It's totally shifting rates to affect the competition. They're misallocating the true cost of Wats to other carriers and high-volume users," he said.


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*Technology Portending Changes*

# Huge Changes Forecast for Banking Industry

By Bill Laberis
CW Staff

NEW YORK — Deep tremors are rocking the foundation of the American banking industry, portending changes that will be hastened by data communications and electronic banking technology.

Prevailing economic conditions and proposed mergers between leading financial institutions will result in the "proliferation of an enormous amount of telecommunications and data processing facilities in a linked network that has never been seen before," Ed Berlin, vice-president of Citibank Corp. here, said in a recent interview.

In addition, plummeting hardware costs will allow more small banks to automate their services. Escalating communications costs meanwhile will force the industry as a whole to seek alternatives to AT&T, principally in communications satellite technology, Berlin predicted.

"Technology is fueling what we hope is an inevitable move toward allowing interstate banking," he said. "It [interstate banking] will make the industry more competitive overall and will result in a great increase in demand for computer and data communications services."

The lifting of federal restrictions on interstate banking will itself fuel a concerted and unified push by the industry for communications standards and systems compatibility, Berlin said. The federal McFadden Act now prohibits banks from taking deposits in different states, effectively quashing interstate banking.

"The industry will demand standards and compatibility, and I believe its technology requirements will be great enough that those demands will not be ignored," he said.

The savings and loan (S&L) institutions, characterized by relatively small local banks with much of their assets in mortgage loans, are in deep trouble, some analysts feel.

Prohibited by federal law from making profitable corporate loans and from holding vast corporate profits, these thrift institutions have been ravaged by skyrocketing interest rates.

With the prime rate hovering around 20%, S&Ls find their mortgage portfolios yielding less than 10%, a significant paper loss.

In addition, double-digit inflation has made it economically unwise for depositors to hold sizable bank deposits in accounts paying only 5.5%, the interest rate at S&Ls.

Meanwhile the highly touted money market certificates are paying upwards of 15%, causing disintermediation, or a mass migration of the S&L deposits to the higher yielding investments in unregulated markets usually dominated by the big brokerage houses like Merrill Lynch.

### Merger Activity

Recently proposed mergers like the one between American Express Co. and the brokerage firm of Shearson Loeb Rhodes would allow customers to get banking-type services not available from the regulated commercial banks.

Some analysts feel the large financial commitment such companies have already made to communications and data processing will put them in the driver's seat when interstate banking restrictions are lifted.

Many federally insured S&Ls, meanwhile, lacking sufficient operating capital and a diverse investment portfolio, are swimming in red ink. The federal government, committed since the Depression to control and regulate the S&Ls as well as to bail out any of those that go under, must make a decision soon.

But there is some concern in Washington, D.C., and throughout the S&L community that rapid growth in interstate banking would sound the death knell for the smaller S&Ls, particularly with the competitive edge gained as the larger banks invest more heavily in the expensive, state-of-the-art data processing and communications equipment to bank across state lines.

"Electronic communications and the proliferation of electronic funds transfers [EFT] and the movement of credit card companies into some of the bank-like services is giving impetus to interstate banking," Lamar Smith, chief economist of the U.S. Senate Banking Committee, said in a recent phone interview.

Smith said that the smaller banks may find themselves in a position of buying some of their computer and communications services from the bigger banks as the latter seek to get the most for their capital investments.

"The technology is there for some banks to move immediately across state lines, even though it would mean establishing essentially new communications and EFT networks," Citibank's Berlin said. "Even the smaller banks have automatic teller machines [ATM] to help with back-office processing."

"But the move could be tough for a lot of those smaller banks because of the communications costs associated with the move," he added. "A lot of banks had counted on inexpensive, affordable rates from AT&T. Now a number of major banks have signed onto the communications satellite networks. The industry has no choice, as communications is the heart of the matter here. To continue to rely on terrestrial carriers is suicidal."

Robert Grant, vice-president of the consulting firm of Booz, Allen & Hamilton here, predicted technology's share of the value-added stream in providing banking services will rise from the present 20% to around 80% as banking regulations are lifted.

"The competitive dynamics in banking will change as the high-technology firms — the Merrill Lynches and the American Express' — will be in the best position to move," Grant said in an interview here. "The companies that have already invested millions in state-of-the-art equipment will be poised to take over national markets."

"At any rate, interstate banking will be made far simpler, if not wholly possible, because of technology," Grant said. "It is driving banking nationwide."

# Fujitsu Enters 'Largest System' Sweeps

*(Continued from Page 1)*

com M-382, a dual-processor system that the firm claimed can be configured with between 32M bytes and 128M bytes of main storage. Channel and throughput characteristics are the same as the M-380.

Both systems employ 64K-byte memory chips, a Fujitsu spokesman said.

The systems run under Fujitsu's OS4/F4 operating system, which the firm compared to IBM's MVS/SP operating system. The systems are not plug-compatible.

Ratings of millions of instructions per second (Mips) are reportedly 15 Mips for the M-380 and 30 Mips for the M-382. Fujitsu said the new units offer between 2.1 and 4.5 times the processing power of the firm's heretofore largest system, the M-200.

In its announcement, Fujitsu noted the processors incorporated the latest in large-scale integration technology, citing among other features 1,300- and 400 gate/chip integrations. According to a spokesman for National Advanced Systems Corp., the 1,300 gate/chip characteristic by industry standards is considered very large-scale integration.

### Three-Level Storage

Moreover, Fujitsu noted the systems adopted three-level hierarchical storage for improved system throughput. Besides the main storage, the system has a 64K-byte high-speed local buffer storage in the CPU and a 256K-byte high-speed global buffer.

Fujitsu also used this double buffer and logic chips with 1,300 gates in its Dips 45/11 system, which the company sells on an exclusive basis to the Nippon Telegraph and Telephone Public Corp.

The firm also pointed to its new horizontal air cooling system, which reportedly permits every element to be uniformly cooled and reduces the space needed for installation. For example, the M-380 is said to occupy 20 square meters of floor space, compared with the IBM 3081 requirement of 38 square meters.

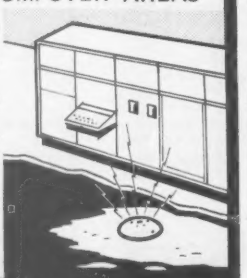
Fujitsu's announcement appears to be a response to the Japanese government's desire to have all its mainframe firms introduce mammoth systems for use in the country, one observer noted. Last September, Nippon Electric Co. introduced a high-end mainframe, the Acos 1000, and last February Hitachi Ltd. unveiled its M-280H, which the firm claimed has a performance range beyond IBM's 3081. [CW, March 2].

Although Fujitsu's new systems cannot be marketed in the U.S. because of an agreement the Japanese maker has with Amdahl Corp., a Fujitsu spokesman said the firm is exploring the possibility of offering the systems in the European and Australian markets. However, for the time being, the systems will be sold only in Japan. Fujitsu owns 32% of Amdahl and is precluded from offering high-end systems in the U.S.

Even though the M-380 and M-382 makes use of some of the same hardware technology found in Amdahl's newest 580 systems, the Japanese units are a totally different design, an Amdahl spokesman said. Although Amdahl had little to say about the announcements, the spokesman noted that the use of 64K-byte chips in the system was no technological advantage. Amdahl will use that technology in its products as soon as the price of a 64K-byte chip is less than four times that for a 16K-byte chip, he said.

Fujitsu will start shipping the system in Japan next April to September. The firm said it intends to sell 50 M-382s and 100 M-380s in Japan in the next four years.

Purchase prices for the system were not available, but the M-380 reportedly rents for about $223,700/mo including the processor, software and a 2.5G-byte disk system. The M-382 wih peripherals and software is said to have a monthly rental of $402,700.

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# Some Win, Some Lose in OPM 'Settlements'

By Marcia Blumenthal
CW Staff

NEW YORK — Some users who leased computer systems from the bankrupt OPM Leasing Services, Inc. will be stuck with unwanted systems, although the company has managed to work out satisfactory arrangements with others, according to the firm's trustee in bankruptcy.

Within the past month, OPM has been able to work out "settlements" with about 20 to 30 users, James P. Hassett said. These settlements are not financial, but rather involve arrangements made to upgrade current equipment or remarket leased equipment that is no longer appropriate for a lessee's needs.

Although OPM is attempting to work out arrangements with users, undoubtedly some will be stuck with their systems, Hassett noted. In some cases, there is no current market for the systems users are leasing, particularly low-end 370 equipment.

Prior to the time OPM declared bankruptcy in March [CW, March 23], the firm had written about 1,200 leases, generally at rates significantly below those offered by other lessors. It has been estimated lessees and institutions that financed the equipment may stand to lose a total of a $250 million [CW, April 6].

Many of those leases were indemnity or long-term leases, but had "crawl-away" clauses that allowed users to terminate leases earlier than stipulated in the lease contract. However, when OPM filed for protection under federal bankruptcy laws, users were unable to take early-out options. In addition, they are still obligated to pay out the full amount borrowed to finance those leases, even though they never planned on keeping the equipment for the full term.

### Few Suits

To date, only a few users have sued OPM over these lease arrangements. Among these are the major litigants — Rockwell International Corp., Western Electric Co., Evans Products Co. and XKF Industries, Hassett noted. He said OPM expected several other "minor" suits to be filed, but they will probably be settled.

Although it appears not many other lessors have been called in to help remarket equipment at the present time, some lessors have expressed interest in doing so. The important thing is to have an orderly disposition of the systems, noted Edward Cherney, president of CMI Corp.

If the equipment is gathered and warehoused for a long period of time and then allowed to flood onto the market, OPM lessees will not get as good a deal remarketing the equipment as they would if it is gradually placed, Cherney reasoned.

OPM is still in the process of working out arrangements with creditors. The next general meeting of creditors is scheduled here tomorrow.

# Bell to Ask Suit Dismissal

*(Continued from Page 1)*

W. James Browne, now a private consultant, but formerly manager of the Bell System's Purchased Products Division, spent most of one day describing his progressive disillusionment with the operation. He and others reported that evaluation reports were intentionally altered to make Western Electric products look better than they actually were, and competitive offerings worse.

When cross-examined by AT&T attorney George Saunders, Browne refused to agree that Western Electric has inherent price advantages over independent manufacturers. Browne also refused to back down on his statement that the evaluation reports contained "arithmetic manipulations to present Western Electric products in the most self-serving way."

There was "a general awareness" such techniques had to be employed "because the price relationships were embarrassing," he added.

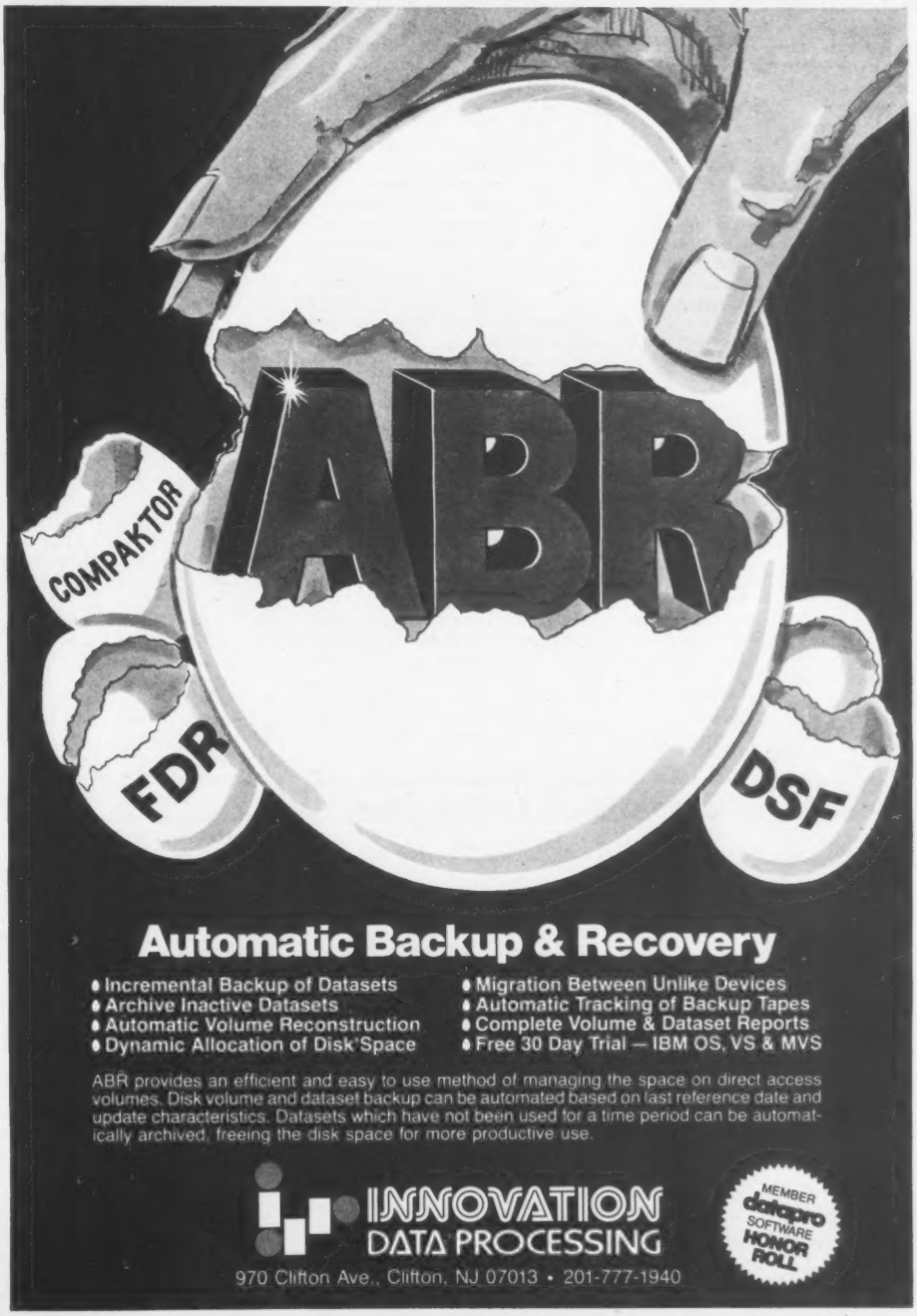
### Datran Testimony

Among the witnesses who followed Browne on the stand were Ralph R. Johnson and E.V. Farenholt, former officials of the Data Transmission Co. (Datran), the specialized carrier that went broke in 1976 allegedly because of predatory conduct on AT&T's part.

According to Farenholt, AT&T did not begin planning its Dataphone Digital Service (DDS) until after Datran sought authority from the Federal Communications Commission to market a similar offering. Johnson added that Bell, through articles and advertisements in the trade press, told prospects to wait for DDS and that "there was a slowdown afterwards in Datran signing customers."

The DDS tariff was another blow, Johnson said. Datran had to reduce its rates some 40% to remain competitive, and this made prospective customers even more hesitant — they wondered whether the reduced revenue would jeopardize the company's chances of survival, he testified.

AT&T's Saunders quoted from an Arthur D. Little report indicating that Datran's start-up plan was "far too costly." Saunders contended that Datran's rates were so high that the company would have been forced to reduce them regardless of what AT&T charged for DDS. Johnson vigorously disagreed on both counts.

*UK DPers Finding Greener Fields*

# U.S. Firms Welcoming This British Invasion

By Ann Dooley
CW Staff

FRAMINGHAM, Mass. — The British are coming and this time they're attacking the U.S. computer industry at its weakest point — the scarcity of experienced computer professionals.

But instead of resisting the enemy, several New England companies in desperate need of experienced programmers and analysts are greeting the British with open arms.

The British have been recruited to the U.S. through the services of E.J. Rhodes Associates, a professional search and management consulting firm here. The intent, the company stresses, is to supplement, not replace American labor. "The shortage of personnel in this area has reached crisis proportions. DP jobs are being created at a much faster rate than manpower is being trained," Lee Silver, Rhodes president, said.

A number of British professionals are eager to emigrate to the states, according to Malcolm Seaton-Wood, managing director of Rhodes International, Ltd., who also runs a British computer recruitment firm in London. The recession crippling Great Britain has affected hiring within the British DP industry, and computer projects are being shelved in businesses all across the empire, Seaton-Wood said. That, coupled with high inflation in the UK and the better working environment here, results in few problems in finding qualified British employees who want to emigrate, he added.

Since Rhodes began its international venture a little over a year ago, eight British DPers have been recruited to work at Zayre Corp.; seven at Paul Revere Companies, an insurance company in Worcester, Mass.; and seven or possibly more have been hired by a major New England food chain.

Silver and Seaton-Wood have recently formed a joint-venture agreement to continue their recruitment of British high-technology professionals, aiming particularly at software technicians and electrical engineers.

The transition from the old world to the new is being made easy for the new residents. All of the immigration paperwork is handled by Rhodes, so neither the hiring company nor the new residents have to grapple with the mountain of paperwork involved in allowing an alien to work in the country.

### Buddy System

Rhodes also sets up a "buddy" system so the new employee is greeted by an American family at the airport and provided with a furnished apartment until individuals can make their own arrangements. The salaries — strictly competitive with their U.S. counterparts — will range on the average from $24,000 to $32,000, according to Silver

The British DPer is provided with specific job descriptions and details about the local schools and living environment. Most of the British employees who come to the U.S. expect to remain here permanently.

Besides wanting to work in a country that is on the forefront in developing computer technology and applications, professional development is more common here than in the U.K., according to Seaton-Wood. Career pathing, a lower cost of living and a spirit of adventure all influence people to come, he noted.

After being settled in this country, the new recruits are not treated any differently from any other employees as a guard against alienating U.S. coworkers.

The people most interested in moving to the U.S. are the top people, according to Seaton-Wood, because they feel they can advance their careers further by living here. Rhodes maintains that it can offer to a client an employee exactly fitted to the job requirements. It does this reportedly by working with the client company through every step of the process, including job definition, search preinterview and final salary and benefit negotiations. And the claims are apparently true — Zayre offered jobs to 13 of the 18 applicants they interviewed, an unusually high number according to a Zayre official.

Although Rhodes wants to keep its client base exclusive so it can give a high level of service to clients, Silver and Seaton-Wood are also planning to expand outside of the New England area and even to recruit employees from such countries as Australia, New Zealand and Israel.

# Burroughs Offering to Buy Back B800s

*(Continued from Page 1)*

tems deals quiet, *Computerworld* interviewed two users that were approached by the vendor with trade-in offers. Earlier this year, Burroughs contacted Robert Hammons of Hammons & Associates, an accounting firm in Boise, Idaho, and offered to work out a settlement for his allegedly defective B800. The settlement would involve taking back the B800 and installing a B900, Hammons said.

Hammons purchased the B800 in 1978 for about $62,000 and took delivery of the system in early 1979. He said he bought the 128K-byte system — the first B800 shipped to Idaho — on a salesman's claim that it could multiprocess and handle up to 36 interactive terminals.

However, the system never performed as the Burroughs salesman had promised, Hammons said.

Although Hammons never filed suit against Burroughs, he did contact a lawyer representing a number of clients that have filed suits against the vendor, including Century Automotive Machines. (Hammons and one of his employees were scheduled to appear as key witnesses in the Century Automotive trial last March before the trial was moved to an as-yet unscheduled date. Located in Twin Falls, Century Automotive would have been the first company to face Burroughs in court in the B800 imbroglio [CW, March 30].)

### Preliminary Complaint

After discussing the particulars of the case, Hammons and his lawyer drafted a preliminary complaint. As Hammons' lawyer prepared to file the complaint and officially began litigation against Burroughs, attorneys for the firm contacted his office and offered to work out a settlement.

Shortly after that, Charles Gardner, Burroughs Western regional sales manager for general accounts, told Hammons that Burroughs would deliver a B900 processor "and all equipment and all accessories" in trade for his B800 system. Burroughs also offered to fly Hammons and an operator to one of two B900 test sites to see the system in action, the user said.

However, Hammons refused to accept Burroughs' deal until the company would give him a letter of commitment for the B900 and a guarantee that he would get his money back if he was not satisfied with the system.

At this point, Hammons said, Gardner broke off communications with Hammons and turned his case over to Patrick Ryan, another Burroughs employee. At press time, neither Hammons nor his lawyer had heard from Burroughs for nearly two months.

The second firm reportedly contacted by Burroughs is currently at the contractual stage and awaiting Burroughs' approval of a number of amendments it added to the contract. The user, which asked to remain anonymous, said these amendments basically consist of several requirements arrived at through a survey conducted previously by Burroughs of the user's system needs.

Although the firm had previously hinted it would file suit to get satisfaction, no legal action was ever taken against the computer vendor.

In the swap, Burroughs has allegedly agreed to credit the user for the full B800 purchase cost, believed to be about $60,000 with software, and deliver a B900 for an additional sum of approximately $5,000, sources said.

The user's B800 hardware is worth about 90% of its full system cost in the current market. On the other hand, the B900 — introduced in August 1980 and just being shipped — costs an average of $76,000, according to Burroughs figures. The anonymous user's B800 system software, supplied by the now-defunct Caprock Computing, Inc. of Lubbock, Texas, was designed to handle the firm's individual needs and may be impossible to resell to another user, an informed source pointed out.

In addition, as part of the systems exchange deal, Burroughs has reportedly agreed not to charge the company for any maintenance fees due on the old B800.

Two accounting firms located in Southern California have reportedly already swapped their ailing B800s for B900s. However, neither the identity of the firms nor details of the exchange could be substantiated at press time.

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*Check local listings for time.

# Chicago Course Set on Software

NORTHLAKE, Ill. — The Chicago Chapter of the Association of Computing Machinery (ACM) has announced a professional development seminar, "Managing Software Development and Maintenance," to be held here June 20. The seminar will be presented by Prof. Carma L. McClure of Northwestern University.

The seminar is intended for software practitioners involved in the development and maintenance of software systems, software managers and students of software engineering.

Early registration for this conference, which includes text, coffee breaks and lunch, is $50. Further details are available from the Chicago Chapter of ACM, through P.O. Box 2381, Chicago, Ill. 60690.

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# Big Users Said Fearful of Bell Deregulation

(Continued from Page 1)
how the Bell unregulated subsidiary can attach and staff a competitive service force without simultaneously creating severe labor dislocations and unrest in the [operating companies]," said Gordon, whose clients include several large corporations.

Because of the growing use of information networks and the speed of office automation, "what's needed today is a truly national, coherent, end-to-end . . . service organization" combined with transmission facilities that provide even higher reliability than is currently available, Gordon said.

**Fragmentation to Increase?**

However, deregulation, as viewed by telecommunications managers for large companies, will produce increased fragmentation and reduced reliability, according to Gordon.

Another speaker, communications attorney Joseph Kittner, contended that if AT&T is allowed to enter unregulated markets where real competition does not exist, telecommunications users will be far worse off than they are now.

Kittner maintained that instead of paying a standard price specified in a tariff, each user will have to bargain with the phone company for the best deal it can get. His key point was that the phone company should be unleashed only in those markets where real competition already is in place. There are few such markets today, he added.

AT&T's migration strategy illustrates what is likely to happen when effective competition is lacking, according to Walter Bolter, chief economist for the House Telecommunications Subcommittee. Prices of older equipment, such as private branch exchanges, can be raised to a point where users are impelled to migrate to newer equipment.

Bolter also suggested that without competition, AT&T would be able to force some customers to subsidize the rates paid by others.

While regulation has not prevented AT&T from using these and similar practices to keep competitors at bay, the basic question facing the policymakers is whether deregulation will be an improvement, suggested Walter Hinchman, former chief of the Federal Communications Commission's (FCC) Common Carrier Bureau and now a private consultant.

Hinchman has argued for a long time that the only way to prevent AT&T from exploiting its market position unfairly is to divest the Bell system along the lines advocated by the Justice Department in its current antitrust suit.

**Deregulation Misnomer**

Hinchman maintained that "deregulation" is probably a misnomer for what Congress and the FCC are advocating.

Only some aspects of AT&T's activities are being freed of regulation, while others remain subject to FCC control, "albeit of a considerably different variety than has been attempted in the past," he added.

During the past couple of years, "the commission has embraced a number of novel and largely untested regulatory reform concepts, such as heavy reliance on resale opportunities, market forces, separate marketing subsidiaries and simplified cost determination and rate-making procedures," Hinchman explained.

"The commission has also embraced several new policy initiatives, such as its recent cellular radio decision, designed to give AT&T a head start rather than . . . an even break in developing and implementing new technologies and services."

These actions "constitute a massive, across-the-board deregulatory or nonregulatory thrust affecting all of AT&T's operations and services," Hinchman added.

## Three Cities Set To Get Course On Software

LOS ANGELES — Gerald Murine will present a course on how to quantify software in three different locations this July, in conjunction with the Education Foundation of the Data Processing Management Association (DPMA). Murine is a principal consultant to Softech, Inc.

The program will be given in Williamsburg, Va., July 6-7; Boston, July 9-10; and Washington, D.C., July 27-28.

Among topics to be examined will be how to quantify software quality and how to select quality factors, criteria and elements.

Registration is $425 per person, with member and group discounts available from the DPMA Conferences Department SQM, 5959 W. Century Blvd., P.O. Box 91295, Los Angeles, Calif. 90009.

## Correction

Panafax Corp.'s MV-3000 Transverter Series was incorrectly identified [CW, June 1] as a microprocessor-based desktop facsimile transceiver. MV-3000 is a minicomputer-based machine.

The correct name of the president of Panafax Corp. is Denis Krusos.

## Washington ACM to Hear Lecht Speak on June 18

COLLEGE PARK, Md. — "Electronic Pathways to Innovation for the 1980s" is the subject of an address by Charles P. Lecht, slated here June 18 at the 20th Annual Technical Symposium of the Washington, D.C., Chapter of the Association for Computing Machinery (ACM).

Lecht, author, teacher and prognosticator in the computer industry, is president and chairman of the board of Advanced Computer Techniques Corp. Also speaking will be Daniel D. McCracken, former president of ACM and current chairman of the History of Computing Committee of the American Federation of Information Processing Societies.

Registration fees range from $30 to $50. Further information is available from R. David Walker, 5100 Hampden Lane, Bethesda, Md. 20014.

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*No. 1 Objective: Competition*

# New FCC Chief Comes Out for Deregulation

By Bruce Hoard
CW Staff

WASHINGTON, D.C. — Echoing the sentiments that swept Ronald Reagan into the White House, the newly appointed chairman of the Federal Communications Commission (FCC) last week condemned the government for its unwarranted intrusions into the communications marketplace.

The FCC's No. 1 objective is "to create, to the maximum extent possible, an unregulated, competitive marketplace environment for the development of telecommunications," Mark Fowler said in his keynote address at the annual meeting of the International Communications Association (ICA) here.

The role of the FCC is to regulate, not operate, the former radio announcer said. Toward that end, the commission has taken some positive steps, but has "only scratched the surface," he added.

### Cutback on Regulations

The second objective under the Fowler regime is "to eliminate unnecessary regulations and policies." That means dumping those rules, regulations and policies that have no public benefit compared with their costs, he said. In support of that objective, Fowler cited a poll conducted by *Time Magazine*, in which 65% of those who responded wanted less government regulation and 70% said they wanted government out of their lives.

The new FCC chairman's third objective was "To provide service to the public in the most efficient, expeditious manner possible." The FCC must keep pace with the technological expertise of the organizations and individuals in the telecommunications industry, Fowler said.

The waiting times for broadcast licenses (six years) and aeronautical frequencies (six months) are too long, he added. One way to reduce those periods is by making the FCC more responsive to the public sector, and that means returning phone calls, disseminating information rapidly and having access to files and records.

### International Coordination

Calling ICA the "voice of America," the keynote speaker said the fourth objective is "To promote the coordination and planning of international communications, which assures the vital interest of the American public in commerce, defense and foreign policy."

Goals in that area include enhancing international trade in telecommunications equipment, improving the transborder data flow and, "most importantly," responding to the congressional mandate that the FCC coordinate this country's position at international communications conferences.

Fowler, a member of the communications law firm of Fowler and Meyers, P.C., said he has moved to establish an office of international coordination. That office would strike an alliance among the government agencies and industries falling under the purview of the FCC.

Objective five is "To eliminate government action that infringes the freedom of speech and the press." Fowler said he is particulary sensitive to the "overbroad use" of its power and would work to prevent the blurring of service definitions.

"All of our regulatory actions must be infused with particular concern that we appropriately balance the First Amendment rights of the American people as the intended beneficiaries of our regulation," he continued.

Asking to be measured only by the success or failure of the FCC to meet his objectives, he added, "I assure you that I may be our harshest critic."

## *Dangers Cited In Deregulation*

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Relying exclusively on free market competition to control prices and services in the telecommunications industry could be a massive mistake, attorney Lewis Rivlin said here last week.

AT&T "obviously is unafraid to inflict a 35% rate increase on its private-line customers and an even larger increase upon certain of its Wats [Wide-Area Telecommunications Service] customers," Rivlin said in a talk to the annual meeting of the International Communications Association (ICA).

"Free market restraints on AT&T due to competitive pressures are virtually nonexistent; MCI [Communications Corp.] followed AT&T's price increases promptly with its own, casting great doubt upon the theory that competition exists in the interchange [long-distance] market."

Additional rate increases are in the offing, Rivlin said. AT&T has said that to compete on equal terms in a deregulated market, it must be allowed to depreciate its terminal equipment much more quickly.

If the Federal Communications Commission agrees, annual depreciation rates will increase $194 million for older PBX equipment and $15 million for newer electronic PBXs, he said, adding, "an increase in depreciation expenses is passed on directly to the customer."

### Potential Trouble Spot

Another telecommunications trouble spot involves companies operating overseas and subject to international privacy guidelines, he said.

The code of conduct recently adopted by the Organization for Economic Cooperation and Development (OECD) may be superseded by a convention that the Council of Europe has developed and could lead to additional limitations on transborder data flows, Rivlin explained.

Next October, the OECD Council of Ministers is scheduled to assess the performance of member countries in adopting and implementing the guidelines. Only about 35 U.S. corporations have implemented them.

Observers fear that "if the report of U.S. performance were given today, it would be less than satisfactory. There is further concern that, this being the case, data protection enthusiasts in Sweden, France, Germany and Austria, to name a few, will lobby to abandon the guidelines as an ineffective international standard for treatment of personal information and adopt in their stead the more stringent and binding measures embodied in the Council of Europe convention," he concluded.

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For those who require even more hard disk storage, Ohio Scientific offers another microcomputer in the C3 Series, the C3-B. Its specifications are the same as those of the C3-C. However, the C3-B offers a 74 Megabyte Winchester drive.



For those who do not need hard disk capacity now, but in all probability will need it in the future, Ohio Scientific offers the C3-A. It is like the C3-B and the C3-C in all respects but two. 48K RAM is standard in the C3-A, and it offers 12 open slots. When more storage is needed, the C3-A is easily expandable to either a 36 Megabyte or 74 Megabyte hard disk system. The C3-A is priced at less than $6,000.

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# Organizations Need Generalists: Consultant

By Brad Schultz
CW Staff

WASHINGTON, D.C. — DP user organizations need generalists to manage the integration of four basic disciplines: computing, telecommunications, office systems and data base administration.

So said consultant Paul Traux at the International Communications Association (ICA) conference here last week. Large users should establish an "information czar" as the person in charge of all applications of four disciplines, Traux advised, and should manage information as a key asset, similar in importance to money and people.

Less than 5% of America's 500 largest companies have initiated the latter approach, often called information resources management (IRM), Traux estimated. However, many companies realize that DP, telecommunications and office specialists must learn to work together, he said.

CW at ICA

Management information systems (MIS) and DP functions report to different people in some organizations, Traux observed, explaining that MIS concerns flow of reports, documents and data for decision making, while DP concerns storage and processing of information that supports management as well as other activities.

Some users have their financial director in charge of DP, "almost anyone" in charge of telecommunications and the administrative services director running office systems, the consultant said. This sort of arrangement prevents users from establishing a common language to discuss management of information and information processing technology, he added.

### 'Miniczar' Generalists

"We need to build a consortium of expertise in user organizations," Traux told a session of the conference. The user's information czar should be a general administrator advised by a number of "miniczars" who are also generalists, but have different tools for managing the four disciplines coming to bear on DP.

Proctor & Gamble calls its miniczars "change agents," Traux noted. The 3M Co. has eight miniczars and other companies warming to this approach were said to include Hercules, Inc. of Wilmington, Del., and Contintental Bank.

Such miniczars of information management should transfer ownership of problem-solving tools to user departments within the organization, Traux maintained. Once a company's strategic plan is formulated, user departments — rather than corporate executives — should tell the miniczars what the departments need to abide by the plan.

Then the miniczars should learn from each other and from technical experts what tools are available for solving user department problems. Traux said generalists qualified for jobs as miniczars are scarce, "but you don't have to find too many of them."

These people — who typically have experience in at least two of the four disciplines affecting DP as well as management backgrounds — usually command high salaries, he pointed out.

### Central Factor

The central technological factor driving the need for generalist managers to adopt an IBM approach is development of programmable workstations, featuring megabytes of storage and communications versatility, Traux told the session.

However, the four disciplines of computing, telecommunications, office systems and data base administration cannot be fully integrated yet because of incompatibility between different brands of equipment, he said. Nevertheless, incompatibility will have to be resolved, he maintained, because the era of single-vendor dependence is over.


References furnished upon request.




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# Integrated Teletex Network Predicted for UK by '82

By Brad Schultz
CW Staff

WASHINGTON, D.C. — The man who runs telecommunications between the UK and other nations said last week that many types of computers and office systems in his country will link through a national teletex network next year, and British public networks may be more sophisticated than U.S. counterparts a few years after that.

The senior director of British Telecom International (BTI), James Hodgson, told the International Communications Association (ICA) conference here that the U.S. appears far from having teletex, but the service for communications among DP and office devices is coming soon to European nations via national networks with gateways to each other. As the British Post Office's overseas telecommunications division, BTI corresponds more heavily with the U.S. than any other organization outside North America.

### 'New Spirit'

"A new spirit is sweeping over Europe," Hodgson remarked, noting that the UK and 25 other nations have formed the European Conference of Postal Telecommunications Administrations to promote technological independence from the U.S.

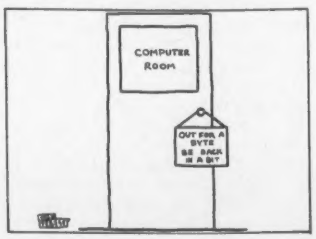
"We in the Old World owe a great deal to you in the New World," he said; but the U.S. has taken "wrong turnings" in telecommunications, failing to match Europe's enthusiasm for new services such as teletex and videotex, which renders home access to computer-stored data bases.

Teletex, videotex, telex store and forward, facsimile and conventional data communications will run to British users through one kind of terminal, Hodgson predicted. This "universal message service" may be similar to AT&T's much-delayed Advanced Communications Service, the BTI chief asserted, and could arrive by the late 1980s.

Hodgson offered some good news to American users with leased private line links to the UK. When BTI formally separates from the British Post Office in the fall, it will introduce a new range of lease rates for 1,200-, 2,400-, 4,800- and 9,600 bit/sec data communications across the Atlantic. About 60% of America's leased transatlantic data lines terminate in the UK.

The coming rates should reduce costs for American users, Hodgson indicated, and will feature discounts for transmissions during off-peak hours. The cost of a three-minute transatlantic call fell 86% since 1956, he said.

The North Atlantic now is the world's most active region for international telecommunications, he observed.



*Costs May Rise Less*

# Traffic in Packet Networks Seen Doubling

By Bruce Hoard
CW Staff

WASHINGTON, D.C. — Traffic on the traditional packet-switched network may double while the costs of operating the network rise by only two-thirds, Howard Frank, president of Network Analysis Corp., told attendees at the International Communications Association (ICA) conference here last week.

Frank discussed the pros and cons of packet switching, and compared it to other networks in a well-received talk at the 34th annual meeting of the ICA.

Packet switching is more reliable than centralized networks because of the multiplicity of nodes and links it offers, Frank explained. With only one path between nodes, the older systems are useless when that link is broken.

On the other hand, a packet network, which may have as many nodes as paths, is much more unlikely to suffer a complete data stoppage because of the constant availability of alternative routes, he maintained.

Circuit switching, most commonly found in telephone networks, is at a disadvantage to packet switching because it frequently spends a prohibitive amount of time in setting up a data transaction, Frank noted. That setting up includes the time spent dialing up a destination and establishing a path for the data.

Circuit-switched networks are also limited by their low data utilization rates, he added. For example, a circuit-switched channel carrying data at a conventional rate of 9,600 bit/sec may only be transmitting bits 3% of the time, he observed.

### Minis Aided Packet Switching

Although packet switching was constrained by the limits of hardware in its earlier days, the advent of the minicomputer and improved lines made it possible to send bigger packets without the fear of insufficient storage capacity throughout the network, Frank said.

A typical packet-switched message has a header describing its contents that is entered onto the network by a computer. The network divides the message into smaller units known as packets.

The network also initiates a conversation with the destination node and routes the various packets there, not always along identical paths.

Packet networks employ a method known as minimum link traffic routing, which simply means it sends packets through the path of least resistance where there is already the least traffic, Frank said. IBM's Systems Network Architecture uses the same technique, he added.

All is not necessarily rosy with packet switching, however. Delays may actually render some networks useless for certain applications, Frank declared. Common delay elements include terminal propagation, network processing and host processing delay.

What appears to be between an 8- and 150 msec delay in a normal packet-switched transaction can easily become as high as 650 msec by the time a message is received and acknowledged, Frank said, adding that host processor delays can take the total time up to two or three seconds.

There is no good delay formula, he explained. The critical factors involved — routing, delay and capacity — combine to form a "random probabilistic type of answer."

As for the ideal network utilization rate, he suggested 60% to 70%. Packet-switched networks work fine at such levels, but have a tendency to "fall apart" when asked to do too much.

"The problem with operating at 90% and 92% is [that is] the equivalent of death," he quipped.

Frank noted costs are usually independent of distance, capacity is allocated as it is needed through the technique's "natural multiplexing" abilities, undetected errors are extremely low and the protocols used make it possible for different types of terminals to communicate with each other.

CW at ICA

Frank's company did a study for the Federal Reserve Bank, which was processing 40 billion checks a year in 1975. The study showed the average transaction would originally run at 10 cents per check and drop to .03 cents per check. At the time, the Federal Reserve was spending 60 cents per check. It is now building its own packet switching network.

It is also possible to maintain a hybrid network in which the user utilizes a combination of the two permanently.

Frank warned against that because the high rate of technological development could render parts of the network obsolete.

He strongly recommended packet networks for users whose monthly telecommunications bills are at or exceed $100,000.





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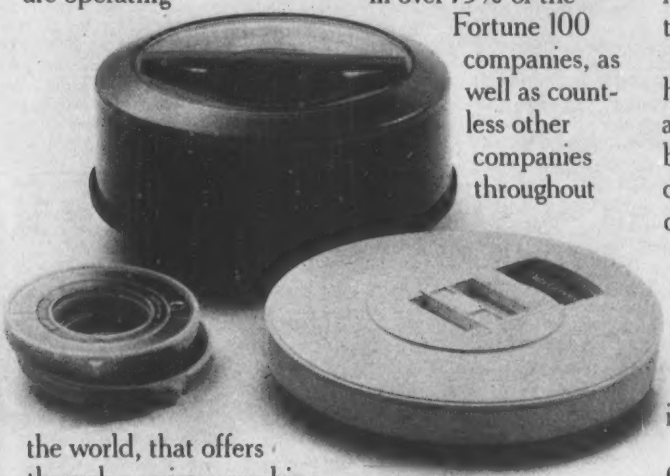
Astonishing, particularly when one considers that almost all of it has gone for systems that, to put it mildly, are incomplete.

In point of fact, it's lamentably rare to find any DDP system that doesn't suffer from one form of this malady or another.

Some manufacturers have seemingly mastered the hardware but are all too wanting in software.

While others are reasonably sound at software but at best only fair when it comes to communications.

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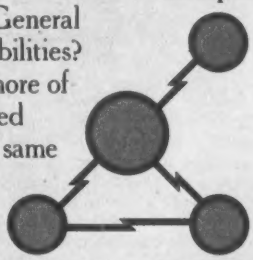
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*Technology Outpacing Laws, Lawyer Warns*

# Get Involved in Halting Crime, DPers Urged

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Getting a grip on computer-related crime will require more DP community involvement in the legal system, attorney, author and DP crime expert August Bequai said last week.

Addressing a seminar here on federal information systems security, Bequai noted that the convergence of DP and communications technologies and the proliferation of electronic funds transfer systems spell the advent of a cashless society.

"It's going to be all little electronic blips," he said, predicting opportunities for white-collar crime will skyrocket with the growth of the new technologies.

"You're going to have to have a legal system that addresses those needs," Bequai said, adding "the sad, sad truth of the matter is that we don't have it now."

Indicating the "disastrous record" of the current legal system, Bequai said "it's antiquated. It isn't working; it isn't addressing the needs of the victim." In short, he said, "it isn't helping anybody."

Lawyers have too long monopolized the system, he told his audience, composed primarily of federal DPers. "You have to get involved, because if you don't get involved we're all in trouble."

### Coming to Grips

The data processing and computer science communities must learn about the law, about courts, about prosecution — whether they like it or not, according to Bequai.

In addition, prosecutors are going to have to learn how to deal with white-collar crime in general and computer crime in particular, he said. Unfortunately, law schools, which should be offering courses in modern technology, "are still back in the 17th century."

Bequai placed much of the burden for enlightening legal practitioners on the technical community. Lawyers "tend to be a more isolated, monastic bunch," he said.

That does not mean technicians will have to become legal experts, nor will lawyers have to become computer programmers. He suggested a basic familiarity with U.S. law and the legal process can be obtained easily.

"You can read; you can keep abreast of developments," Bequai said, arguing citizens should not be cowed by the "secular religion" that has grown up around the practice of law.

### Developments Needed

Other necessary developments include:

- Education of the public to the problems of the legal profession in dealing with crime in general. "A democracy lives by consensus, by education," he said.
- "We're going to have to simplify the legal process . . . it is misery to see people once they enter the legal process. It can drag on for years and years," he said. "You can't go around spending zillions of dollars prosecuting white-collar crime."
- Specific legislation will be needed. He noted several states now have computer crime laws and lamented the fact similar legislation has not been passed by the U.S.
- Tougher sentences for white-collar criminals, coupled with statutes allowing easy recovery of embezzled money, would act as a good deterrent, he said.
- "We're going to have to uplift the ethics in business and government"; he said, and there should be a code of ethics in the DP profession.
- An articulated government policy for attacking white-collar crime. "If the Carter administration had a white-collar crime strategy, it was the best kept secret in town," Bequai said. He added the Reagan administration is no better.

# SBS Requests FCC Denial Of AT&T's Picturephone

WASHINGTON, D.C. — AT&T's request that the Federal Communications Commission (FCC) authorize it to begin implementing a video teleconferencing service should be denied or at least restricted, Satellite Business Systems (SBS) told the commission late last month.

Echoing earlier concerns of the Computer and Business Equipment Manufacturers Association (Cbema), SBS said AT&T's proposed Picturephone Meeting Service (PMS) must be offered through one or more separate subsidiaries, rather than directly by Bell operating companies.

Moreover, the phone company must be required to supply additional economic and technical details, SBS said.

"Given ... the commission's unfortunate experience in granting Section 214 authorizations for Dataphone Digital Service without adequate data being submitted, the commission must carefully analyze the implications of new service ventures such as PMS," SBS said.

## Correction

The price of $22,000 quoted for Cullinane Database Systems, Inc.'s IDMS Journal Reporter on Page 46 of the May 25 issue was incorrect.

The price of the Culprit report generator package is $25,000.


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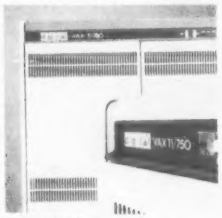
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# Industry Exec Backs Information Institute Bill

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — "Watershed legislation." That was the endorsement by an industry spokesman as hearings continued recently on a bill to set up a federal body that would consider national information policy issues.

The bill, introduced in April by Rep. George E. Brown Jr. (D-Calif.), would establish an Institute for Information Policy and Research to address information-related questions. It also calls for a special presidential adviser for information technology and science information [CW, June 1].

The Information Science and Technology Act of 1981 "holds out the possibility of a single focal point for the discussion of information policy issues, a discussion that is currently fragmented across the whole face of the federal government structure," according to Robert S. Willard, vice-president of the Information Industry Association (IIA).

Testifying May 28 before a House of Representatives science and technology subcommittee, Willard said some sort of central focus is needed because "information is largely taken for granted, and despite the crucial role it plays in our day-to-day existence, it is not a subject which demands, or enjoys, the attention of the American populace or our policymaking structure."

Testimony on the legislation has not been universally supportive. Several agencies, including the National Telecommunications and Information Administration and the National Science Foundation, have scrambled to protect their turf, fighting to retain activities the bill would transfer to the institute.

### Conceptual Problems

Willard conceded there are political and conceptual problems with the present draft of the bill, but predicted it would "provide a mechanism for addressing a large range of information policy issues."

He specifically endorsed the legislation's provision that the proposed institute and special presidential assistant not have policymaking power. "The principal agency empowered to establish information policy is the Congress," he noted.

However, he added, Congress "is not organized to give information policy issues the attention they deserve. Just as these responsibilities are fragmented with the executive agencies, the Congress suffers the same affliction."

Estimating there are approximately 100 House and Senate subcommittees dealing with information issues to some extent, Willard said "the necessary in-depth expertise on information issues is missing."

To the extent the proposed information institute could act as "expert staff to the Congress," it would be invaluable. "Through focused research and the give-and-take of open policy discussion, the institute will be able to present to Congress the full outlines of various information policy issues," he said.

Turning to the bill's provision for a special White House information advisor, Willard expressed doubts about the position's effectiveness.

"Past experience," he said, "has shown us that the placement of an official with designated issue responsibilities in the White House does not necessarily mean that issue will receive presidential attention. More important is the President's own personal priorities.

"If the President feels attention should be paid to information issues, he can assign them to any of his highest deputies, even the Vice-President," Willard said. "On the other hand, if he is uninterested, it is not very likely the new special assistant will have much clout within the Executive Office of the President."

Given the political realities of executive appointments, he cautioned the assistant and key officials of the proposed information institute would more than likely reflect the political philosophy of the President.

Willard suggested specific language be added to the bill to ensure a diversity of political viewpoints will be represented.

There should probably not be "any excessive enthusiasm for immediate and visible benefits of this legislation," Willard concluded. "The establishment of the institute and the designation of a senior White House official will not per se lead to a dramatic improvement in the way this nation addresses information issues.

"But," he said, "we do believe that such steps will lead to some improvement which, in the long run, could prove to be most dramatic. The attention this bill will focus on information issues will be a significant force in these improvements."


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# Speech Analysis Confirms Presidents' Images

By Bill Laberis
CW Staff

AUSTIN, Texas — An innovative Cobol program has gone a long way to "isolate what many people probably felt about recent U.S. presidents without really knowing why they felt it," according to the program's developer.

Termed Diction, the program was used recently to analyze 266 major speeches of the last seven presidents, excluding President Reagan. The speeches used were made before similar audiences or on like topics and policy areas to maintain some experimental control.

By applying some linguistic and communications know-how to the computer analysis of the speeches, Dr. Roderick Hart of the University of Texas here produced results that were faithful to what is generally conceded as the popular perception of the presidents.

"It didn't seem likely that a computer could sense the dynamism and Fourth-of-July-type characteristics of a Nixon, the down-to-earth realism of a Truman or the vagueness of a Carter," Hart said.

"But the computer is very methodical and quite objective and does a good job of doing what it's told, and my formulas used to interpret the data are normative ones," he added. "I guess the results speak for themselves."

Diction uses a series of built-in categorical dictionaries or word groups that scan a given passage fed into a computer. The system then prints out the frequency of usage of targeted words and dictionaries, analyzing them by means of a programmed weighting scale, essentially performing a language and word use accounting of the content.

### Isolates, Extracts Patterns

The particular dictionary categories were designed to isolate and extract patterns such as simplicity, rigidity, pugnacity, demagoguery and the like from the speeches. Hart then performed his own linguistic analysis "by means of some simple equations used to examine patterns in speech behavior," he said.

For example, in the rigidity category the computer listed the frequency of use of the verb "to be" and words like "never" and "always" and other hard verbs that demonstrate an unwavering position on an issue.

In this category, former President Truman outpointed the rest of the field by a long shot, showing what Hart called the extraordinary rigidity "which got him in a lot of trouble while making him a lot of friends."

Truman also scored high in the pragmatic category, living up to his nickname of "Plain Speaking Harry," Hart noted.

On the other hand, Diction and Hart observed that former President Eisenhower spoke in an extremely abstract fashion, a tendency that frequently rendered him unable to sound particularly realistic or assuring, but more often sermonic.

"He was wordy and often tonguetied, speaking in something other than the language of the common man," Hart said. "In plain English — something he should have used more often — he beat around the bush when he should have been more direct."

### Nixon a 'Flag-Waver'

Former President Nixon scored high in the pragmatic and dynamic categories, speaking with a choice of uncomplicated words that imparted a feeling of power and control, Hart said.

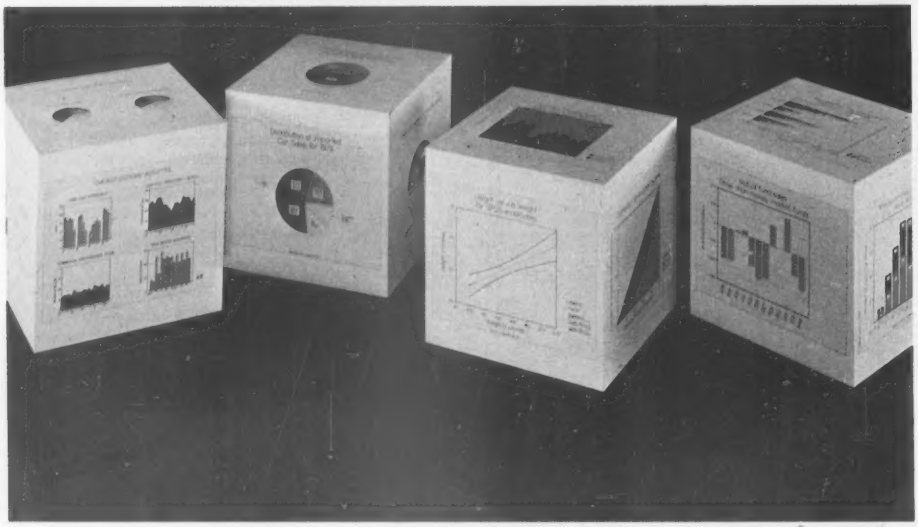
However, he was also a blatant red, white and blue flag-waver, leaning heavily on the use of basic American symbols like democracy, freedom, national security and duty. Hart noted Nixon was "by far the heaviest employer of that category of words, using them three times as often as Kennedy."

Finally, Diction showed that former President Carter's manner of public speaking was as tentative, unassuring and unrealistic as the masses of voters last November believed him to be.

In the category of activity, whose heavy word use Hart said demonstrates motion and dynamism, Carter scored the lowest of all presidents anaylzed.

"He passed himself off, for a while anyway, as a simple and pragmatic yet forceful man," Hart said. "In reality he proved otherwise, and his word use bears this out. He did not talk about practical things in practical ways."


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*Say Cost Too Low*

# Chicago Aldermen Halt Computerized Survey

By Lois Paul
CW Staff

CHICAGO — Can the price tag on a computerized survey ever be too low? Local politicians here think so.

Five Chicago aldermen have filed suit to stop the spending of taxpayers' money for a neighborhood needs survey. The aldermen say it cannot be done for only $375,000.

The aldermen have obtained a court order halting progress of the survey and withholding payment of the research group conducting it for Mayor Jane Byrne.

Another and possibly more relevant complaint is that the survey of more than 200,000 Chicagoans is a political tool for the mayor and therefore should be paid for out of her political funds.

The survey includes questions asking respondents to rate the city administration, their aldermen, ward committeemen and precinct captains.

### 'Lack of Knowledge'

According to Chuck Green, who is working with Eugene Dawson and the Professional Computer Applications group on the survey, the surprise at the low cost reflects a general lack of knowledge of microcomputer technology.

"The city council allocated $375,000 for the survey. They never expected to find people who could do it for this price," Green said, noting that his group is doing the survey for $1.50 per questionnaire.

They are able to charge a low amount, Green said, because they are using microcomputers instead of the more costly mainframes and minicomputers generally used by professional survey firms.

Green and Dawson are using an Apple Computer, Inc. Apple II, a 14M-byte Altos Computer Systems, Inc. microcomputer and an Amdahl Corp. 470 V/8. They leased the microcomputers and are using the larger system on a time-sharing basis.

"We are giving them a $10 million survey effort for $375,000. The aldermen are saying we either are not doing the survey correctly or something is wrong," he said, adding, "No one knows micros. This is the reason they don't understand how we can do it for this price."

Green's group is using a virtual machine concept with the microcomputers and the mainframe working on the same data, interchangeably, he explained. The use of virtual machines has driven the cost down so ridiculously that it is suspect, Green said.

They had planned mainly to use the Apple II and Altos equipment, but the need for daily reports forced them to come up with processing before they were ready. This in turn moved them toward use of the mainframe.

The microcomputers are used for on-line data collection and then dump the results into the Amdahl 470 V/8 at the end of each day for batch processing.

### Dissertation Topic

Green, a Ph.D. candidate in educational research and evaluation at Virginia Polytechnic Institute, said the idea of the survey attracted him when Phyllis M. Johnson, who wrote the questionnaire, approached because he was looking for a dissertation topic.

Two years ago, Green completed a national survey regarding public television's children's programming involving 30,000 surveys. He used an Apple II running under the CP/M operating system. He became involved in Johnson's survey when he showed her the results.

Gene Dawson of Apt-List Data Processing developed the software for the Chicago survey, using Microfocus, Ltd.'s CICS Cobol, as well as Basic and Applesoft.

Green said his group was asked for plans and schedules three weeks earlier than had been anticipated. To accomplish this, Dawson wrote a Basic program and used a Forms II utility package from Microfocus to turn out 75% of the program, according to Green.

Green said the alderman's complaints really are an attack on the mayor. The aldermen are calling the survey political, saying that Mayor Byrne is asking these questions to identify her supporters for the next election.

The current limbo state of the survey is causing problems for Green's group. "The project is so large and the company so small, we can't really put it aside and go into something else. We are forced to wait," he said. During the suspension they are fine-tuning the program.

The problems plaguing the survey process also are causing a personal dilemma for Green. He has to complete his doctoral dissertation by the end of 1982 and is using the survey as a basis for his research. His topic is the impact of microcomputer technology on survey research.


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# Larry Long's List of Professional Societies

*Larry Long is compiling a list of professional DP/computer societies and organizations. To be included, societies and organizations should send a brief description of their purposes and objectives to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.*

**• CENTER FOR COMPUTER/LAW**

*Purpose and Objectives:* The center is a nonprofit, educational organization that focuses on research, education and publishing in the fields of computer, communication and information law. Members of the center include individuals and corporations in both the DP and legal fields.

The major goal of the center is to assist in the orderly development of laws and regulations impacting the computer field, and to that end it publishes the *Computer/Law Journal* and a variety of books and monographs. The center also publishes an occasional newsletter for members and is currently preparing to open a research library that will be available exclusively to its members.

*For More Information:* Michael D. Scott, Executive Director, Center for Computer/Law, P.O. Box 54308, T.A., Los Angeles, Calif. 90054.

**• COMPUTER LAW ASSOCIATION, INC. (CLA)**

*Purpose and Objectives:* The CLA was formed to fill the need for mutual education by lawyers concerned with the unique legal considerations related to the evolution, production, marketing, acquisition and use of computer communications technology.

The plan was to bring together for informal and later formal discussions lawyers who were actually working in the field, in business corporations, in private practice and in government. The first meeting was held in the fall of 1971. The group has met at least semiannually since then.

Over the years, the CLA has sponsored a wide variety of programs covering such areas as the use of the computer as a litigation tool; data banks and privacy; competition in the computer and communications industries; contracting for computer technology; and computer communications issues, particularly the Federal Communications Commission's Second Computer Inquiry and the proposed legislation affecting telecommunications.

Also included have been the effects of the new Copyright Act on computer technology; the work of the National Commission on New Technological Uses of Copyrighted Works (Contu); and Federal, state, local and international taxation of computer-related properties, transactions and activities.

Other programs have included electronic funds transfer systems, liability for computer usage, computer technology in the next decade, contracting in the computer industry, the marketing of software by nonsoftware specialists and negotiating contracts for custom software.

The CLA is committed to providing lawyers and law students concerned with the legal aspects of computers, computer services and computer communications a forum for their professional examination. With the opening of meetings to nonmembers, the possibilities for creation of a useful interdisciplinary dialogue have been greatly enhanced.

*For More Information:* Daniel T. Brooks, CLA Secretary, 6106 Lorcom Court, Springfield, Va. 22152.

**• DATA ENTRY MANAGEMENT ASSOCIATION (DEMA)**

*Purpose and Objectives:* Dema is an international nonprofit educational association. Its goals are to promote the professional growth and enhance the prestige of the men and women responsible for caputring data from the computer. Since its founding in 1976, the association has continued to expand the services and benefits available to its growing membership.

Dema sponsors a major annual conference and exposition in the fall and several miniconferences and seminars are held in convenient locations in the spring. The association provides a monthly newsletter, special studies and statistical reports, including yearly equipment and statistical-compensation surveys.

A reference library and advisory and consulting services are available through the Dema office. Local chapters have been established in several areas and others are in the process of being formed.

*For More Information:* Marilyn Bodek, Executive Director, Data Entry Management Association, P.O. Box 3231, Stamford, Conn. 06905.

**• FORUM INTERNATIONAL**

*Purpose and Objectives:* Forum International is an independent nonprofit association of North American users of the data processing equipment manufactured or marketed by ICL, Inc., TRW, Inc. and/or ex-Singer Business Machines. Most members utilize either the System 10 or 1500 processors, point-of-sale terminals, 1900/2900 equipment or some combination of these. There are members throughout the U.S., Canada and Mexico.

*For More Information:* Norwin A. Merens, Managing Director, Forum International, 4300-L Lincoln Ave, Rolling Meadows, Ill. 60008.


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REPUBLIC AIRLINES

# Readers' Views on Health Care DP

Turnaround Time
By Larry E. Long

Dear Readers:

I received a number of responses to rather harsh statements I made indicting the pace of progress of health care systems. The following are representative responses.

*Fundamental, but often overlooked, is the simple fact that physicians, not patients, are the primary customers of the hospital. Therefore, hospital administrators are faced with the task of balancing the need to improve operational efficiencies with the need to cater to the wishes of their customers — conceptually no different than any business.*

*As more and more applications are visibly credible, physicians are becoming more willing to gamble your well-being on a technology they don't thoroughly understand.*

*It may take another 10 to 20 years before the great majority of physicians will gamble your life and their livelihood on electronic technology. I'm not sure that this pace of progress isn't about right.*

— — —

*I can appreciate the frustration of your hospital DP correspondent. The health care environment is a challenge that the data processing profession has not responded to adequately.*

*There are several factors in the application of digital technology to health care that seriously inhibit progress including the following:*

*1. Participant payback is low for health care professionals. The health care professional and the patient see little immediate payback and look at most digital devices, terminals and so on as detriments to their efforts rather than aids.*

*2. Digital system performance and reliability remain too low.*

*3. The health care administrative and operational environments are complex and unstable.*

— — —

*I believe you have already identified a major cause of failure in these projects in your statement, "DP people, with the assistance of medical people, have attempted to automate."*

*The cart is placed well ahead of the horse with this kind of project organization, especially considering the reputation of medical professionals for self-confidence, status consciousness and professional jealousy. The MDs and others involved in these systems projects cannot be assigned a simple "end-user" role in health care project development.*

*For a health care project to be successful, it must clearly be "owned" by the medical community, especially the end users (who may often react negatively due to professional jealousy).*

*The project manager chosen should be a medical professional with strong ties to the end users and should possess superior skill in interpersonal relationships. The DP staff can be expected to contribute creatively and effectively in technical DP areas, but the leadership must at least appear to be completely drawn from the medical professionals associated with the project.*

*DP personnel are also well-known for superior self-confidence and forcefulness, but cannot often be successfully matched against medical professionals for confidence and manipulative skill, especially in the medical professionals' own backyard.*

*For work with medical professionals, I suggest that DPers should reevaluate their projected image and adopt a more respectful, sublimated, self-deprecating manner.*

*After the project is neatly completed and accepted by the medical professional, the DPer can step forward and take his bow, being certain that proper credit is given to the professional user.*

*I know that this manner is unnatural for DP people, but then again you can always act superior while making deposits at the bank.*

— — —

*The role of the medical professional is underestimated. The nurse, physician and other medical professionals are akin to neither the blue-collar production line worker, the white-collar manager nor the research scientist.*

*The medical professional is a highly educated person with very specialized technical skills and, until very recently, no exposure to or understanding of computers.*

— — —

*The main problem as I see it is getting the physicians and other key personnel together for the initial evaluation and decision process.*

*Too many clinics give a change in information processing a low priority on their "things-to-do" list. Once they have taken the time to observe a demonstration and weigh the many advantages of having their own system, it is all downhill from there.*

---

*Long is a professor at Lehigh University, a DP consultant and author.*

*Have a question? Send it to Larry Long, Editorial Department,* **Computerworld,** *Box 880, Framingham, Mass. 01701.*


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# Videotex Policy Seen Based on Outmoded Laws

By Phil Hirsch
CW Washington Bureau

TORONTO — Government policymakers are making decisions about videotex and teletext services on the basis of outmoded concepts and laws, according to Richard M. Neustadt, a member of former President Carter's White House Staff and now a private attorney.

The reason, Neustadt said at the recent Videotex '81 conference here, is that videotex and teletext cross the long-established boundaries separating telephone, television and cable regulation. A closely related problem is that many policy decisions will "depend on how markets develop. Some of these issues may still be murky when we reconvene for Videotex '91."

An underlying question posed by videotex and teletext technology is the extent to which transmission and content should be separated, he said.

### Effects of Separation

Maximum separation of content and transmission would permit competition among information providers, Neustadt pointed out. Expression of diverse opinions — a key ingredient of democracy — would be encouraged. Also, separation of content and transmission would prevent carriers that control key parts of the nation's transmission network from using this power unfairly — for example, by favoring their own programs over those of another supplier.

However, "if transmission companies are excluded from content, they may lose the incentive to play in the game," he pointed out.

One alternative is to let the carriers — and anyone else — become information providers under rules designed to prevent unfair competition. Essentially, this is the policy adopted by the Federal Communications Commission (FCC) in its Second Computer Inquiry Decision, he explained. However, it has not settled matters.

"Critics argue that the separate subsidiary cannot prevent cross-subsidy or ensure equal treatment. They also say it is impossible to draw a bright line between mass media services [which AT&T is allowed to offer under the Second Computer Inquiry Decision] and other information [which it cannot offer]. Newspapers fear that a computerized Yellow Pages will swallow their classified advertising business. Congress will start voting on this issue in July and no one is betting on the result," Neustadt said.

Another issue raised by the advent of videotex and teletext services is the need for regulating program content. "The U.S. gives newspapers almost total freedom to print what they want. But broadcasters must make time available for political candidates, cover controversial issues fairly and allow people to respond to personal attacks. Some see these rules as outrageous restraints on journalistic freedom, and others see them as vital protections. So there will be a great debate on whether they should cover videotex," he added.

### 'Crazy Quilt'

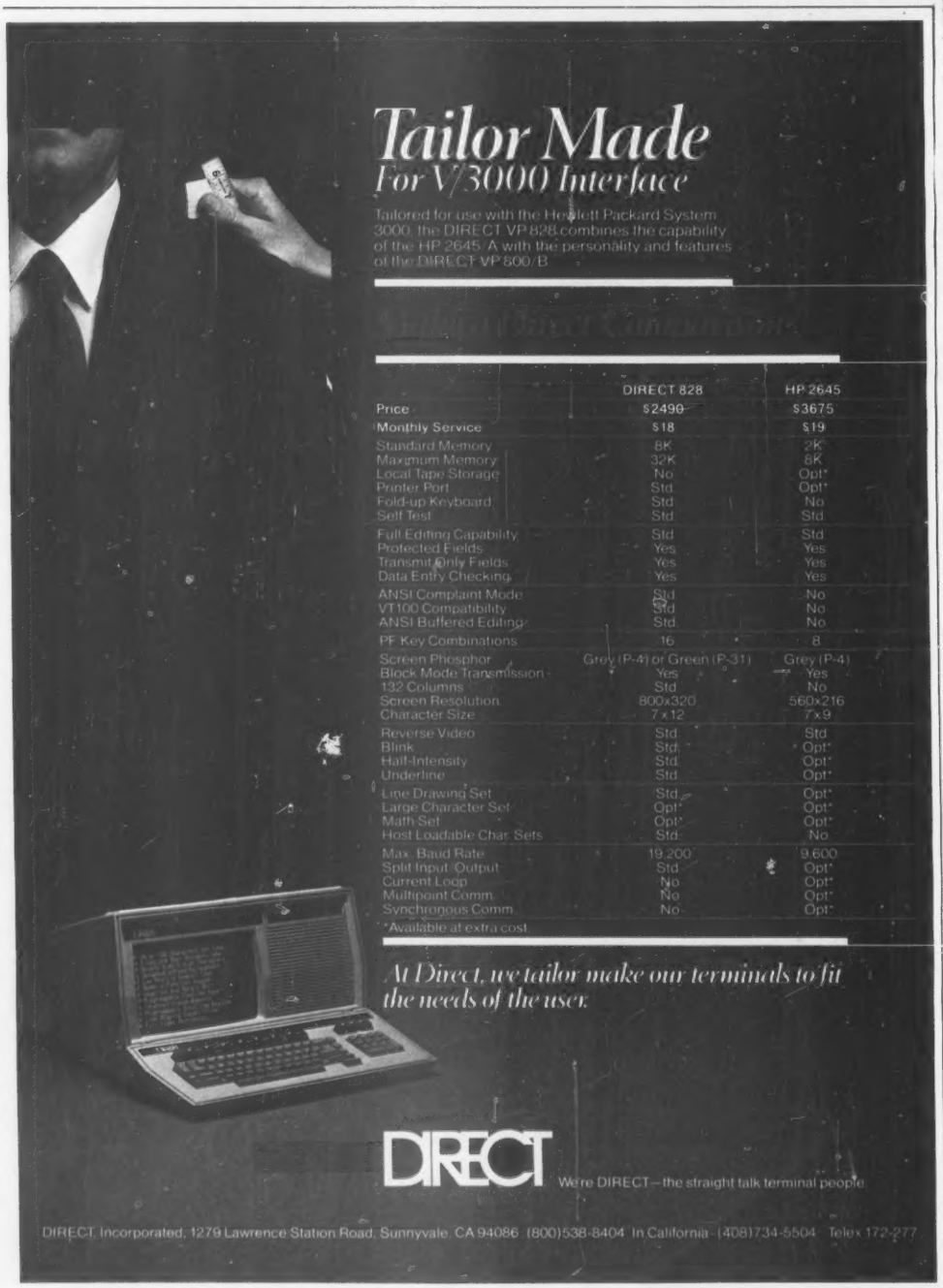
At the moment, it appears that videotex programming is or is not subject to regulation, depending on the transmission medium it uses.

If videotex is sent on a telephone line, for example, the content is not controlled; if it is on a cable channel, content is controlled in most cases, but the FCC can decide not to exercise its authority. Teletext broadcast over a commercial TV channel is also content-controlled, but here the FCC probably cannot forego regulation, Neustadt said.

This "crazy-quilt pattern makes no sense. It is not fair to hobble some services with burdensome content requirements while [others] go free," he added.

Although technological advances — such as growing use of two-way large-capacity cable systems and cellular radio local-distribution networks — may reduce opportunities for monopoly control and thus make it less necessary for Congress and the FCC to get involved, it is likely that "government will make many of the crucial decisions" for a long time, Neustadt said.

"Videotex operators have a lot at stake in these issues," Neustadt added. He suggested that they form an organization to promote and protect their interests, like those already established by most of the other industries interested in on-line information services.




## Newsletter to Cover Legal Office Arena

CORNWALL, N.Y. — A monthly newsletter has been launched to advise legal administrators, lawyers and corporate legal department managers on how best to automate their offices. "Legal Systems Letter" is being written by people from both the legal and automation arenas in a format that is reportedly easy to understand.

Each issue of the newsletter will feature in-depth articles addressing the problems facing today's automated law office, its publisher said.

The annual subscription rate is $117 through July 1 and $140 thereafter. The editor is Cynthia Vik at 423 Angola Road, Cornwall, N.Y., 12518.

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# Managers on the Move

HARTLEY R. GASTON has been elected vice-president of data processing at Shenandoah Life Insurance Co. in Roanoke, Va.

Gaston has had 13 years of experience in life insurance data processing. For the last six years he has been associated with Southwestern Life Insurance Co. in Dallas.

Gaston received his B.S. degree from Louisiana State University and his M.S. from the University of Texas. He is a fellow of the Life Management Institute and is a Chartered Life underwriter.

•••

JOSEPH A. MICHAEL has been appointed vice-president and director of management information services for Avery International. Michael will be responsible for the overall strategicplanning and direction of the company's information systems and will supervise the information processing center in San Marino, Calif.

Formerly, Michael was vice-president, management information services, for Coca-Cola Bottling Co. in Los Angeles. He also held positions with Texfi West and Cambridge Computer Corp. and has served as a management consultant with Booz, Allen and Hamilton.

The graduate of Ohio State earned his B.S. in mathematics and continued his education in the graduate business program of Duquesne University of Pittsburgh.

•••

ASHOK CHAWLA has been named corporate director of systems development in the administrative and management services division of Malinckrodt, Inc. of St. Louis, Mo.

Prior to his promotion, he was manager of distribution services at the St. Louis plant.

An eight-year employee, Chawla graduated with a B.S. degree in mechanical engineering from the Indian Institute of Technology in Kanpur, India. He also earned an M.B.A. from the University of Dallas.

•••

EDWARD P. CHEKNIS has been promoted to vice-president in charge of operations and management information systems for Aparacor, a women's clothing distributorship in Evanston, Ill.

Cheknis has been with the company for 10 years in an information processing capacity.

# Loran C Navigational Aid Talks 'Acadia' to Sailing Victory

By Lois Paul
CW Staff

DALLAS — If the recent results of the Southern Ocean Racing Conference (Sorc) in Florida are any indication, a talking navigator does not necessarily have to resemble one of the muscular sailor types populating certain cigarette and beer commercials. The navigator does not even have to be human.

A Loran C navigational device made by Texas Instruments, Inc. with a TI 9930 Speech Option helped Burt Keenan's *Acadia* advance to a fourth in class in the opening race and to five straight subsequent victories.

According to a TI spokesman here, Keenan was supplied with a prototype of the talking Loran C model for the Sorc. The one Keenan used was the only one in existence. TI plans to begin shipping the product soon.

The Speech Option gives the boat operator Loran C-based information anywhere on the vessel where there is a speaker. The clear, crisp "voice" of the unit can be heard anywhere a user chooses to mount a loudspeaker, TI said. Data also is available on call by pressing a key on the TI 9900 keyboard.

The unit can report eight basic navigational announcements, including time position, speed over the bottom, range to waypoint, time to go at present speed to next waypoint, cross-track error, course made good, and bearing to next waypoint.

An operator can select up to four of the messages at a time, in any order, to repeat at any interval between six seconds and one hour. The normal visual display also can be used.

### Prepare for Admirals Cup

Overall in the Sorc, *Acadia* finished second to *Louisiana Crude* and was one of three yachts picked to represent the U.S. in this summer's Admirals Cup races in England.

Anyone who races Sorc has at least one Loran, but the English have rules against this and any other computer functions in the instrumentation, according to Robbie Doyle, vice-president of Hood Sailmakers in Marblehead, Mass.

He said the new devices take away the art of navigation. "They really have almost replaced the navigator," Doyle explained, noting that the devices are more like a continuous scoreboard.

"Your performance is constantly being measured in a way that is much more accurate," he said, adding, "I think it has probably taken the difference between a good and a bad sailor and made it smaller because the guy who is not doing so well knows it more readily and can work to solve the problems."

Whether Keenan will be able to use the talking Loran C in the Admirals Cup races has not yet been determined. Keenan told a *St. Petersburg Times* reporter that if it is permitted, he may ask TI to change the voice on the unit to something with a British accent, just to give the proper atmosphere.


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July 22 & 23 New York, NY
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# Calendar

June 23-25, Boston — **Data Entry Productivity Seminar.** Contact: Data Entry Digest, 10522 Ridgeway Drive, Santa Ana, Calif. 92705.

June 23-26, Boston — **Software Design, Reliability and Testing.** Contact: Office of Special Programs, Polytechnic Institute of New York, 333 Jay St., Brooklyn, N.Y. 11201.

June 24-25, Chicago — **Advanced Management Skills for Telecommunications Professionals.** Contact: Business Communications Review, 36 S. Washington St., Hinsdale, Ill. 60521.

June 24-25, New York — **SAS Procedure-Writing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

June 24-26, New York — **Pascal.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

June 24-26, Washington, D.C. — **Records Management.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

June 24-26, New York — **Teleconferencing and Satellite Systems Technology Conference.** Contact: Joanne Tupper, Easton Research and Development Corp., Suite 32, 559 Pacific Ave., San Francisco, Calif. 94133.

June 24-26, New York — **Teleconferencing and Satellite Systems Technology.** Contact: McGraw-Hill Conference & Exposition Center, Suite 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

June 24-26. Chicago — **Seminar: Computer Contracting: A Practical Guide.** Contact: Lynete Pauley, International Computer Negotiations, Inc., 1331 Palmetto Ave., Winter Park, Fla. 32789.

June 24-26, Atlantic City, N.J. — **Computer Industry Trade Expo.** Contact: Computer Industry Trade Expo, 110 Charlotte Place, Englewood Cliffs, N.J. 07632.

June 24-27, Blacksburg, Va. — **Microcomputer Design Interfacing, Programming, and Application Using the Z80/8085/8080.** Contact: Dr. Linda Leffel, C.E.C., Virginia Tech, Blacksburg, Va. 24061.

June 25-26, Washington, D.C — **Protocols for Packet Switching.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

June 25-27, Los Angeles — **Designing for Testability.** Contact: Office of Special Programs, Polytechnic Institute of New York, 333 Jay St., Brooklyn, N.Y. 11201.

June 26, Chicago - **Major Mistakes in Communications Management ... And How To Avoid Them.** Contact: Business Communications Review, 36 South St., Hinsdale, Ill. 60521.

June 26, Washington, D.C. — **AT&T and the New Telecommunications Industry Structure.** Contact: Steve Weissman, Associate Publisher, Information Gatekeepers, Inc., 167 Corey Road, Brookline, Mass. 02146.

June 28-30, Denver — **How to Video-Teleconference Successfully.** Contact: Public Service Satellite Consortium, Suite 907, 1660 L St. NW, Washington, D.C. 20036.

June 29-30, Cambridge, Mass. — **Facilities Management for Senior Executives.** Contact: Kreon Cyros, Office of Facilities Management Systems, Room E19-451, MIT, Cambridge, Mass. 02139.

June 29-30, Washington, D.C. — **Advanced Micrographics: Analysis and Design of Microfilm Information Systems.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

June 29-30, Houston — **CAD/CAM: A Management Overview.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

June 29-30, Washington, D.C. — **Advanced Micrographics: Analysis and Design of Microfilm Information Systems.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

June 29-30, New York — **PBXs and Distributed Networks in the Office of the '80s.** Contact: Ernest A. Tu-


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gaudis, Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

June 29-July 1, Nashville, Tenn. — **Eighteenth Design Automation Conference.** Contact: Dave Hightower, Texas Instruments, Inc., Box 225621 MS3907, Dallas, Texas 75265.

June 29-July 2, Atlanta — **International Word Processing Association's Syntopican IX.** Contact: International Word Processing Conference Services, 1015 N. York Road, Willow Grove, Pa. 19090.

June 29-July 3, Washington, D.C. — **Parallel Picture Processing.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

December 1-4, St. Louis — **Call for Papers/1981 National Conference.** Contact: Deborah K. Smith, Director of Conferences, Cause, 737 29th St., Boulder, Colo. 80303. Abstract deadline July 15, 1981.

July 6-7, San Francisco — **Distributed Data Processing Technology.** Contact: Software Research Associates, P.O. Box 2432, San Francisco, Calif. 94126.

July 6-7, Williamsburg, Va. — **Education Foundation Data Processing Management Association "Software Quality Metric" Seminar.** Contact: Data Processing Management Association Conferences, Department SQM, 5959 W. Century Blvd., P.O. Box 91295, Los Angeles, Calif. 90009. Also being held July 9-10 in Boston and July 27-28 in Washington, D.C.

July 6-10, Philadelphia — **Structured Systems Design/ Structured Requirements Definition Combined Course.** Contact: Karen Howard Brown, Ken Orr and Associates, Inc., 715 E. Eighth, Topeka, Kan. 66607. Also being held July 20-24 in Wichita, Kan.

July 6-10, Santa Cruz, Calif. — **The Design and Implementation of Data Bases.** Contact: Adele Wood, University of California Extension, Carriage House, Santa Cruz, Calif. 95064.

July 6-17, Seattle — **Cobol.** Contact: Boeing Computer Services Co., Box 24346, MS/ 9A-90, Seattle, Wash. 98124.

July 7-9, San Francisco — **Data Entry Productivity Seminar.** Contact: Data Entry Digest, 10522 Ridgeway Drive, Santa Ana, Calif. 92705. Also being held July 13-15 in Washington, D.C.

July 8-9, Houston — **Managing Documentation & Documentation Standards.** Contact: Carnegie Press for Documentation Resources, 100 Kings Road, Madison N.J. 07940. Also being held July 23-24 in Detroit and July 30-31 in Boston.

July 8-10, San Francisco — **Art of Managing Data Processing.** Contact: Deborah Tchorzewski, Nolan, Norton & Co., One Forbes Road, Lexington, Mass. 02173.

July 9-10, Minneapolis — **User Documentation.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held July 13-14 in Las Vegas, July 16-17 in San Jose, Calif., July 20-21 in Scottsdale, Ariz. and July 27-28 in Denver.

July 13-14, Los Angeles — **Software: A Legal Briefing for EDP Professionals.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held July 20-21 in Hasbrouck, N.J.

July 13-15, Chicago — **The Automated Office.** Contact: National Institute for Management Research, Department B, P.O. Box 3727, Santa Monica, Calif. 90403.

July 13-15, Los Angeles, —

*(Continued on Page 28)*


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CW 6-8

# Calendar

(Continued from Page 27)

**Computers in Manufacturing/Workshop.** Contact: National Institute for Management Research, Department VPR, P.O. Box 3727, Santa Monica, Calif. 90403. Also being held July 15-17 in Los Angeles.

July 13-15, Washington, D.C. — **Financial Information Systems.** Contact: National Institute for Management Research, Department APR, P.O. Box 3727, Santa Monica, Calif. 90403.

July 13-16, Owego, N.Y. — **Jovial-Ada Users Group.** Contact: Peter Bednar, IBM Corp., FSD, Rt. 17C, 201C67K, Owego, N.Y. 13827.

July 13-17, New York — **Computer Performance Measurement and Capacity Planning.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

July 13-17, Santa Cruz, Calif. — **Computer Statistical Packages.** Contact: Adele Wood, University of California Extension, Carriage House, Santa Cruz, Calif. 95064.

July 13-17, Santa Cruz, Calif. — **Modern Programming Methodology.** Contact: Adele Wood, University of California Extension, Carriage House, Santa Cruz, Calif. 95064.

July 13-24, Seattle — **PL/I.** Contact: Boeing Computer Services Co., Box 24346, MS/9A-90, Seattle, Wash. 98124.

July 14-17, Milwaukee — **Hospital Financial Information Systems.** Contact: Hospital Information Systems Sharing Group, Bill Rosqvist, 2415 S. 2300 W., Salt Lake City, Utah. 84119.

July 15-17, Washington, D.C. — **Summer Computer Simulation Conference.** Contact: William E. Buchanan, Applied Physics Laboratory, Johns Hopkins Road, Laurel, Md. 20810.

July 15-17, Topeka, Kan. — **Model Programming.** Contact: Karen Howard Brown, Ken Orr and Associates, Inc., 715 E. Eighth, Topeka, Kan. 66607.

July 16-17, St. Louis — **The Engineer as Manager.** Contact: Battelle Seminars and Studies Program, 4000 N.E. 41 St., P.O. Box C-5395, Seattle, Wash. 98105.

July 16-17, San Francisco — **Software Quality Assurance.** Contact: Software Research Associates, P.O. Box 2432, San Francisco, Calif. 94126.

July 16-17, Washington, D.C. — **Impact of Computers on Law and Regulation.** Contact: National Center for Administrative Justice, 1776 Massachusetts Ave., N.W., Washington, D.C. 20036.

July 20, St. Louis — **Management Overview of Data Structured Systems Development.** Contact: Karen Howard Brown, Ken Orr and Associates, Inc., 715 E. Eighth, Topeka, Kan. 66607.

July 20, Los Angeles — **Sradis, Management Overview of Structured Systems Development Methodology.** Contact: Herm Rubin, Department K604, Box 516, St. Louis, Mo. 63166. Also being held July 22 in Houston and July 24 in Detroit.

July 20-21, San Francisco — **Requirements Specification With SREM.** Contact: Software Research Associates, P.O. Box 2432, San Francisco, Calif. 94126.

July 20-22, Toronto — **Data Processing Operations Management.** Contact: The University of Chicago, Center for Continuing Education, MC Seminar Division, 1307 E. 60 St., Chicago, Ill. 60637.

July 20-22, San Francisco — **Data Base Administration and Control.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

July 20-22, Washington, D.C. — **Microcomputers in Control Systems.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

July 20-22, Denver — **Facilities for Auditing IBM's DOS/VS Operating Systems.** Contact: Data Processing Audit and Security, 12 Juniper Lane, Framingham, Mass.01701.

July 20-24, Santa Cruz, Calif. — **Microcomputers: Current Capabilities and Future Prospects.** Contact: Adele Wood, University of California Extension, Carriage House, Santa Cruz, Calif. 95064.


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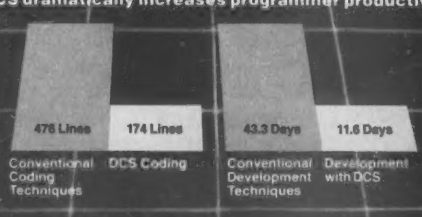
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Children's Television Workshop Photos

**Seated at their 'public-proofed' terminals with oversized keyboards, children — and their parents — can choose from a variety of games.**

# *Game Park's 'Computer Gallery' Drawing Crowds*

**By Bill Laberis**
CW Staff

LANGHORNE, Pa. — Start with the talent of the creators of *Sesame Street*, add the entrepreneurial flair and capital of the Anheuser-Busch Entertainment Corp. and top with the imagination of a former coordinator of public computer education at the University of California at Berkeley.

The result is the first of a proposed nationwide chain of entertainment parks featuring The Computer Gallery, a serendipitous playhall whose purpose is to show the public the friendly, unintimidating side of computer technology.

With the ambience of a carnival, a casino and penny arcade rolled into one, the gallery at Sesame Place here was designed as a multicolored, multimedia attraction to entice even the most computer-wary technological ascetic.

And beneath the gallery's microcomputers, cleverly concealed as interactive games, are powerful teaching tools that can show children, as well as reluctant adults, that the computer is something to be reckoned with in a satisfying and harmless way.

"The idea was to create an environment that signals play and enjoyment while providing people with an opportunity to have hands-on experience with computers, whether they know it or not," according to Joyce Hakansson of the Children's Television Workshop, which brought the world Big Bird and the rest of *Sesame Street*.

The Workshop recruited Hakansson last year from the University of California at Berkeley where she ran a program of demonstrations and workshops to "explain science to the public," she said.

That program, which serviced more than 30,000 people a year, relied heavily on a battery of microcomputers that the program staff redesigned to look appealing and inviting to the DP illiterate.

Now at Sesame Place, Hakansson and her new staff, which includes education spcialists, programmers, artists and interior designers, have unleashed the full force of their creative powers onto the gallery.

The fruits of much of their labor are seen in the specially made keyboard, designed with both aesthetic and pragmatic considerations, Hakansson, a college history major, said.

First of all, the keyboard is flat and the letters are arranged in alphabetical order rather than in a typewriter format. The space bar or return key has been replaced by a large green key with "GO" boldly stamped on it.

To ensure that the keyboards would survive past opening day at Sesame Place, they were "public-proofed" or made heavy-duty to withstand the slings and arrows of outrageous fortune as doled out by over-zealous youngsters who find using their fists more conducive than using their fingers when typing.

### Special Software

Specially designed software, the product of the Workshop's in-house staff, coupled easy-to-read and understand instructions with vivid computer graphics and audio effects.

In fact, only two attendants are needed in the gallery where 56 altered Apple Computer, Inc. microcomputers have been installed, Hakansson said.

She said a good example of the gallery's educational value is given by a game called "Raise the Flag," modeled as a spelling tool after the computerized "Hangman" game.

"We decided that the kids really don't need the element of violence depicted in 'Hangman,' because in general we wanted to present educational programs in a more valid way than they are ordinarily shown," she said.

In the flag game, a graphically animated flagman gets help from the player in raising a word up the pole, a correctly spelled word. As each letter is chosen from the keyboard, the flagman nods either a "Yes" or a "No," raising the word a little higher with each correct letter.

When the word is spelled entirely correctly and hoisted up the staff, the player is rewarded with a rousing audio reveille to the tune of some patriotic composition.

In another game for the younger kids, the characters from the television show *The Muppets* are flashed on the CRT screen and the players are given certain clues to the identity of one of the characters. The child must then use his deductive and reasoning powers, as well as some television savvy, to identify the mystery guest.

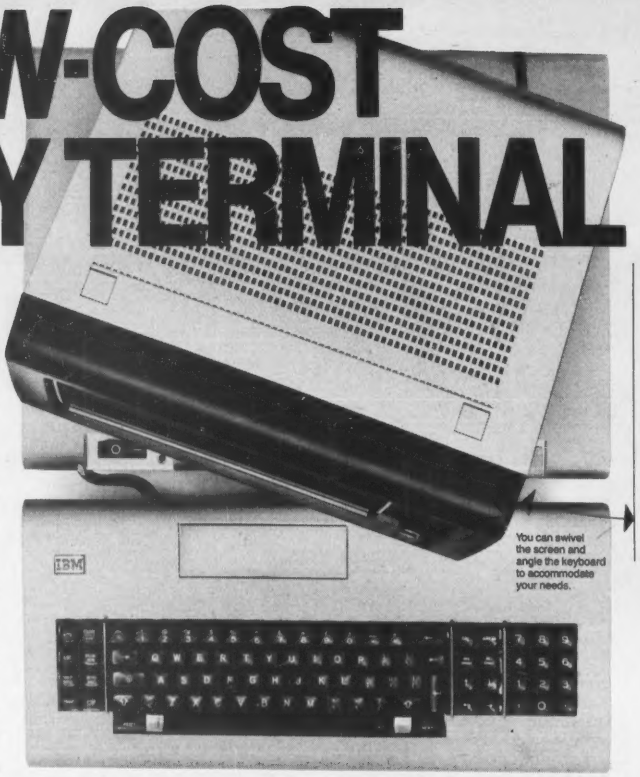
"The goal is to set up a relationship between the user and the machine that puts the user in control," Hakansson said. "It is a tool that serves. That is our message."



**The Computer Gallery at Sesame Place is rarely empty.**

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The keyboard looks familiar because it's much like the IBM Selectric™ The 87 keys

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Setup is do-it-yourself. You place the video on top of the logic element, connect the keyboard and video element and plug in the 3101. Then you simply use the appropriate setup switches to select the desired mode of operation.

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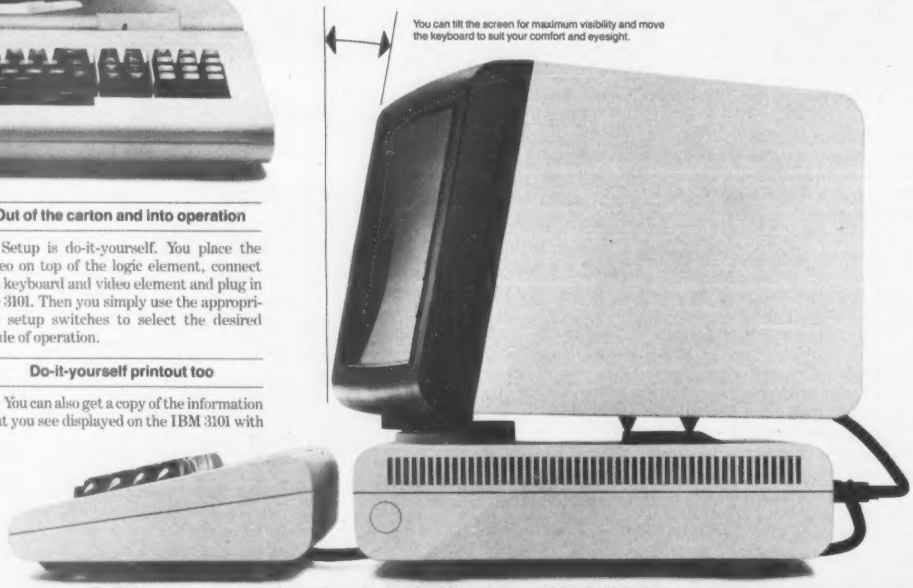
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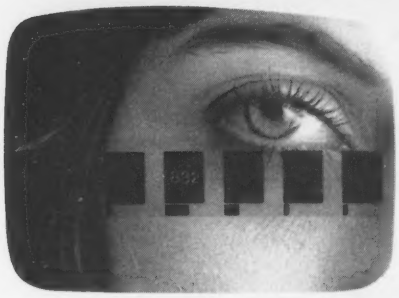
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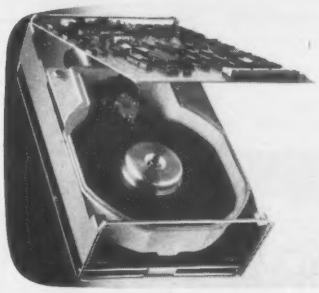
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# INFORMATION ENGINEERING

By Clive Finkelstein

## Part 5: Deriving Procedures From a Data Model

*This is the fifth of six articles on information engineering, a planning methodology for developing corporate data models. It is intended for users and management with no computer experience. Information engineering provides formal DP methodologies for data analysis, data base design and synthesis of program specifications.*

*The articles cover the following topics: (1) information engineering methodologies, (2) developing a corporate data model, (3) information analysis, (4) data analysis and data base design, (5) procedure formation and (6) information engineering development.*

---

Functional areas throughout an organization are responsible for various procedures. Those procedures generally bring about a change in the data associated with an area.

For example, the manufacture of a particular item results in a change in data relevant to that functional area: Raw materials have been used, and so the available raw materials have been reduced by that quantity used. Products have been completed, so the number of products manufactured have been increased, finished product inventory has been increased and the number of finished products still to be manufactured (to meet manufacturing quotas) has been reduced.

Similarly, procedures associated with production of documentation also bring about data changes. For example, the completion of an order form has brought about a change in data: A new order has been accepted and has to be filled and subsequently delivered to the customer. A new order has been added to the number of orders received.

### Establishing Procedures

In most organizations, business procedures are established based on the particular responsibilities and objectives of specific functional areas. Each functional area works with that subset of data relevant to its particular functional responsibility.

Business procedures in many organizations have evolved over time. However, procedures can be designed by examining that subset of data relevant to the functional area in conjunction with a knowledge of its responsibilities and objectives. This design of procedures is called "procedure formation" in information engineering.

As organizations grow, each functional area is allocated a specific purpose and certain responsibilities to fulfill. Objectives are set to indicate how people are to carry out their particular responsibilities; those objectives should be measurable.

In identifying responsibilities and objectives, that subset of data relevant to the functional area is also defined. The data subset generally relates directly to the particular purpose of the function.

For example, the orders department has responsibility for acceptance of orders from customers. Subsequent order fulfillment is based upon inventory stocked in the warehouse. Eventual preparation of invoices to be paid by the customer is the responsibility of the invoicing department.

The various steps carried out by each functional area — that is, the procedure (or process) — can be optimally derived by examining that subset of data relevant to the area. These derived procedures support data creation and maintenance requirements. They may address inquiry and validation needs.

Procedure formation comprises two phases: procedure discovery and procedure consolidation. These contain a number of stages, listed below and described briefly in the following paragraphs:

**Procedure discovery:**

- Stage 1: Data model partitioning.
- Stage 2: Event break-out.
- Stage 3: Condition identification.
- Stage 4: Procedure derivation.
- Stage 5: Procedure expression.

*(Continued on Page 32)*

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**Procedure consolidation:**

- Stage 6: Objectives impact test.
- Stage 7: Partitioned procedure integration.
- Stage 8: Boundary optimization.
- Stage 9: Model quality test.

Procedure formation provides the following:

- Optimized data creation and maintenance procedures that support corporate and unit objectives.
- Procedural alternatives for review against organizational structure, direction and objectives.
- Quality test of a logical data model's ability to support the derived procedures.
- Appreciation of the impact across functional areas of data and procedural physical implementation alternatives.

## Procedure Discovery

**Stage 1: Data model partitioning.** This initial stage uses as input a data model developed using information analysis or data analysis and documented in a data dictionary. It partitions the data model into logical sections to enable subsequent stages to proceed in parallel.

**Stage 2: Event break-out.** The partitioned data model and data dictionary defined in Stage 1 are examined by user department and management personnel (with the assistance of analysts). Events are identified which add, delete or modify the relevant data model entities. This results in the development of an event list and a data access table.

**Stage 3: Condition identification.** Conditions that must be satisfied before or after execution of events are identified and documented, together with conditions that result in repetitive execution of events. These are subsequently used to formally derive the sequence of event execution in procedures. A conditions table is developed.

**Stage 4: Procedure derivation.** Procedures are progressively evolved based on identified events and conditions (from Stages 2 and 3). A graphics technique is used to build up complete procedures from these events. These are called procedure maps.

**Stage 5: Procedure expression.** The procedures derived in Stage 4 as procedure maps are documented in a form acceptable to the organization to highlight the new procedural perspectives developed.

This documentation may take the form of "loose" (user-oriented) structured English or formal structured English for analysts. Alternatively, the procedure maps may be expressed in narrative form, Nassi-Scheiderman charts, Warnier-Orr diagrams, structured analysis data flow diagrams or Jackson program structures. The result is appropriate procedure documentation for the organization.

## Procedure Consolidation

**Stage 6: Objectives impact test.** The derived procedures (procedure maps and appropriate documentation) are then compared against the approved unit objectives. This permits an evaluation of those objectives and their achievement based on the new procedures. New objectives and/or business opportunities may be suggested by the new procedures. Decision support procedures (for decision support systems based on the corporate data model from information analysis) become apparent.

The output from this stage is a major review point and may force various levels of iteration through previous stages.

**Stage 7: Partitioned procedure integration.** The derived procedures to this point are called "partitioned procedures," as they were developed from partitioned data models defined in Stage 1. These procedures are now combined to optimize and consolidate them into procedures to support the corporate data model.

**Stage 8: Boundary optimization.** Integrated procedures from Stage 7 are examined in terms of the organization and its corporate objectives now and projected into the future. They suggest potential new organizational boundaries and restructuring opportunities. In addition, they enable the organization to define an optimum organizational structure for achieving the corporate objec-




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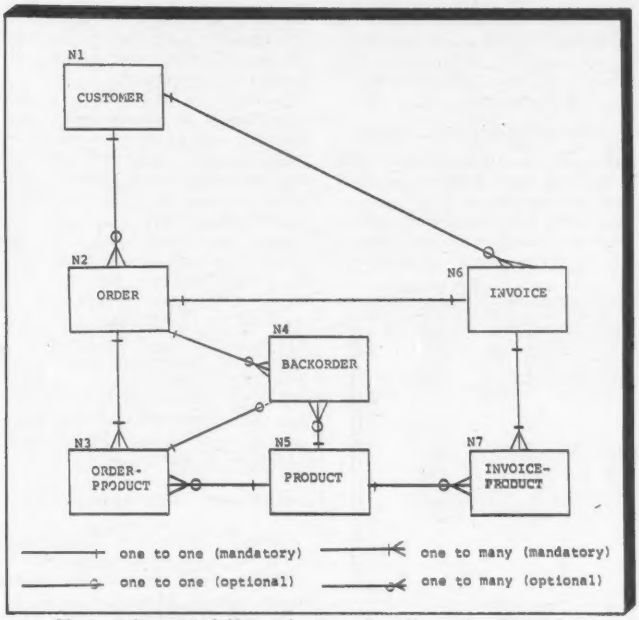



**Figure 1. Data Model Used for Procedure Formation Examples**

| ENTITY NO. | ENTITY NAME | ENTITY CONTENT | SHORT DESCRIPTION |
|---|---|---|---|
| N1 | CUSTOMER | Customer#, customer name, customer address, account balance, credit limit, account closed flag | Customer details |
| N2 | ORDER | Order#, order date, date required, delivery address, customer#, order cancelled flag, order completed flag | Order header |
| N3 | ORDER-PRODUCT | Order#, product#, quantity ordered, order item cancelled flag | Order item |
| N4 | BACKORDER | Order#, product#, quantity on backorder, backorder item cancelled flag, backorder item satisfied flag | Backorder item |
| N5 | PRODUCT | Product#, product name, unit price, balance on hand, minimum balance, reorder quantity, product discontinued flag | Product details |
| N6 | INVOICE | Invoice#, invoice date, customer# order#, invoice total, invoice cancelled flag, invoice paid flag | Invoice header |
| N7 | INVOICE-PRODUCT | Invoice#, product#, quantity this invoice, total price, invoice item cancelled flag | Invoice item |

**Table 1. Entity Dictionary Used for Procedure Formation**

tives, based on the availability of a derived decision support system.

This stage also maps the optimized procedures back to the data model (in a data usage map) to identify those entities accessed by each procedure. This reviews Stage 1 data model partitioning. It provides input for the process verification stages of data analysis and also leads to subsequent evaluation of organizational impact.

**Stage 9: Model quality test.** The integrated procedures are finally cross-checked against the corporate data model. This ensures that the data model will support the derived decision support system when it is physically implemented (using data base or conventional files). It enables review of the data necessary for automating part or all of the derived procedures.

### What Can Be Gained?

Benefits derived from procedure formation include the following:

- New procedures can be derived directly from a data model.
- Derived procedures may cross functional or departmental boundaries or may be confined to existing organizational boundaries.
- Procedures, which are allowed to cross organizational boundaries, may suggest reorganization opportunities. Such reorganization may be essential for the organization to make effective use of a consolidated, corporate data model. The new procedures are derived from the data model and need not suffer from the restrictions of past organizational structure and history.
- The technique is primarily applied by user department personnel with a detailed knowledge of the organization, but no computer experience.
- It applies to derivation of any procedures, whether manual or automated.
- When used in conjunction with information analysis, procedure formation derives procedures that reflect corporate objectives established for the future. Procedure formation is objectives-driven. It provides feedback for evaluation and refinement of objectives and their measurement.
- The technique enables data usage maps to be developed for direct input to data analysis and data base design. It also allows another level of quality test of the data model built during information analysis: This checks that the data model will support decisions that result in data change.
- Procedure formation provides a formal technique for software engineering installations that can be used to develop a new logical model in structured analysis.
- In conjunction with program specification synthesis, detailed module specifications are formally derived. These derived modules automatically exhibit high functional cohesiveness, the end objective of structured design. The module specifications can be expressed in structured English. Alternatively, source program code may be derived directly from procedure formation and program specification synthesis. This bypasses conventional programming.

**Stage 1: Data model partitioning.** The data model documents data relevant to the part of the organization examined. It may have been developed using information analysis or data analysis.

Figure 1 documents a data model of the Widget Corp. Table 1 documents the entity dictionary, which includes the entity list of the data model. The entity dictionary names each data entity (shown schematically in Figure 1) and details its data item contents. A short description is also provided. Each entity is allocated a number Nx, where x is unique.

In examining the data model in Figure 1, we can readily identify (partition) the data for which specific functional areas are responsible. This is referred to as "prime data responsibility."

The accounts department is responsible for the CUSTOMER entity.

The orders department is responsible for the ORDER and ORDER-PRODUCT entities.

The warehouse is responsible for the PRODUCT and BACK ORDER entities.

The invoicing department is responsible for the INVOICE and INVOICE-PRODUCT entities.

The orders department also needs to refer to the CUSTOMER entity to determine the credit status of each customer placing an order. In addition, the invoicing department needs to refer to the CUSTOMER entity to update the account balance and credit limit by the amount of each invoice prepared for that customer and for payment subsequently received. This is known as "secondary data responsibility."

Once entities have been partitioned based on primary and secondary data responsibility, any entities with

*(Continued on Page 34)*

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mandatory associations to those partitioned entities are also included. When the number of partitioned entities exceeds 20 to 25, further partitioning is carried out. This ensures that partitioned data models of a manageable size proceed to later stages.

**Stage 2: Event break-out.** We are concerned with those application events that bring out the addition, deletion or modification of individual entity occurrences. We will identify these data changes as "add entity occurrence" (ANO), "delete entity occurrence" (DNO) and "modify entity occurrence" (MNO).

We will examine each separate entity in turn, considering each of the above data changes. In some cases, more than one event may bring about a particular data change.

As we define each new event, we will uniquely identify it as Ex, where x equals the allocated event number.

Let us first consider the CUSTOMER entity in Table 1 (also documented schematically in Figure 1). This entity is the responsibility of the accounts department.

### Accounts Department Events

The addition of a new CUSTOMER entity is brought about by the event of "Customer Accepted."

It may be necessary, before accepting a new customer, to carry out certain checks such as a verification of the potential customer's credit-worthiness. Only if the customer's credit rating is adequate would that customer then be accepted.

Thus certain conditions must be satisfied before acceptance of the new customer and addition of the CUSTOMER entity. We will consider these essential prior conditions later when we combine application events to form procedures.

The entity change ANO of a CUSTOMER entity is brought about by the event Customer Accepted. We will identify this event as E1. (We assume all mandatory data items are also added by this event. Data items that are not required initially are optional data items. Events that later add these optional items are considered in conjunction with modification of the data entity.) We abbreviate this entity change as:

**ANO:CUSTOMER — E1 : Customer accepted.**

Physical deletion of a CUSTOMER entity may only be acceptable to the organization if the customer's account balance is zero. To enforce this, the organization may first "close off" the customer's account by flagging it. Physical deletion of CUSTOMER entities is only carried for customers whose accounts have been closed off *and* whose account balance is zero. Thus we will identify an event for physical deletion of a CUSTOMER entity as:

**DNO:CUSTOMER —**
**E2 : Closed customer account removed.**

### Modifying an Entity

We will now consider the events that result in modification of a CUSTOMER entity. Examining the CUSTOMER entity in Table 1, we can identify a number of events that change data items. The customer name and address may be changed. The account balance or credit limit may be adjusted. The "account closed" flag may be turned on. Certain of these events may be particularly relevant to some functional areas of the organization.

We will record these events as follows:

**MNO:CUSTOMER —**
**E3 : Customer account closed.**
**E4 : Customer details adjusted.**
**E5 : Customer account balance adjusted.**
**E6 : Customer credit limit adjusted.**

Application event E3 modifies a CUSTOMER entity by turning on the account closed flag. Event E4 changes the customer name or address. Event E5 changes the customer's account balance. Event E6 changes the credit limit.

An event "customer number changed" may not be acceptable (NOT ALLOWED). The organization may instead enforce events of "customer account closed" for the old customer number, followed by "customer accepted" with the new cus-

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tomer number. This enforces an essential audit control that the account balance must first be zero.

Retrieval of a CUSTOMER entity may be necessary both for general inquiry purposes — to display the current status of a particular customer — or for validation purposes. For example, it may be necessary to examine a customer's account balance and credit limit before an order from that customer is accepted.

Retrieval events are not considered specifically at this stage. They are included as necessary during the subsequent stage of procedure derivation, when the conditions associated with events are expanded. Retrieval events are considered further during program specification synthesis.

### Orders Department Events

The addition of an ORDER entity is brought about by the event Order Header Accepted. This is indicated as:

**ANO:ORDER —**
**E7 : Order header accepted.**

Note: The ORDER entity in fact relates to "order header" details. The ORDER-PRODUCT entity (see below) relates to order item details.

We will consider two application events that may bring about deletion of an ORDER entity.

The first instance of deletion is to physically remove a cancelled order header. The original cancellation of that order header may be indicated by turning on an order cancel flag in the ORDER entity. This will cancel the order header, but will not remove that particular order from the system. Only when all action relating to the order has ceased can the cancelled order header be physically removed by deletion.

The other event may delete completed orders that have been shipped to the customer. These orders are no longer required by the system and should therefore be deleted. This deletion may be physical, or instead logical (by turning on an "order completed" flag). During physical data base design, a decision may be taken to retain those completed orders for audit purposes by archiving them. Deletion events are therefore:

**DNO:ORDER —**
**E8 : Cancelled order header removed.**
**E9 : Completed order header removed.**

Two events may modify an ORDER. One event considers general adjustments to the order header details (of order date, date required, delivery address or customer number). The other event considers the cancellation of an order header (by turning on the order cancel flag). We will identify these events as follows:

**MNO:ORDER —**
**E10 : Order header cancelled.**
**E11 : Order header details adjusted.**

The ORDER-PRODUCT entity represents each individual order item comprising an order. This identifies each product and the quantity ordered.

We are concerned with events that bring about addition, deletion or modification of an individual ORDER-PRODUCT. (While several ORDER-PRODUCT entities may comprise an order, we will concern ourselves only with each individual entity occurrence.)

The addition of an ORDER-PRODUCT entity occurs on acceptance of each order item in the order. We will identify this event as follows:

**ANO:ORDER-PRODUCT —**
**E12 : Order item accepted.**

Physical deletion of an ORDER-PRODUCT occurs in two instances: when a completed order item is removed and when a cancelled item is removed. (The cancellation of an individual item may not necessarily imply the cancellation of the entire order. Order items may be individually cancelled.) These events are defined as:

**DNO:ORDER-PRODUCT —**
**E13 : Cancelled order item removed.**
**E14 : Completed order item removed.**

Modification of an ORDER-PRODUCT may occur on adjustment of or-

*(Continued on Page 36)*


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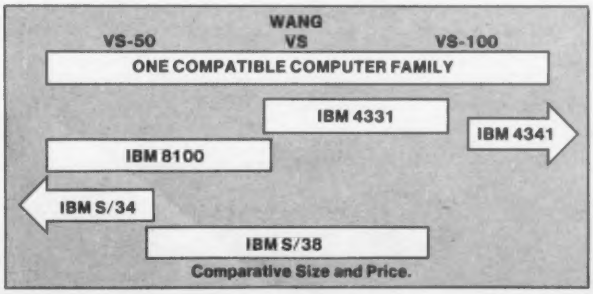
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(Continued from Page 35)

der item details such as a change in the quantity ordered of a particular product. Another modification event may be the cancellation of an order item, by turning on the order cancel flag. (The adjustment of product number in an order item may perhaps only be achieved by cancelling the original order item and then accepting a new order item with the new product number). Two modification events result:

**MNO:ORDER-PRODUCT —**

**E15 : Order item cancelled.**

**E16 : Order item details adjusted.**

We have identified significant events that bring about data changes in different functional areas of the Widget Corp. These events and the entities they relate to are listed below, including events identified by the warehouse and the invoicing department.

An event list such as the one following is built during event breakout (Stage 2). As each event is identified, the list is used to check whether it has previously been recorded. To help reduce problems of the same event appearing several times, the convention of NOUN-VERB is used for naming events.

## EVENT LIST

**CUSTOMER ENTITY**

E1 — Customer accepted.
E2 — Closed customer account removed.
E3 — Customer account closed.
E4 — Customer details adjusted.
E5 — Customer account balance adjusted.
E6 — Customer credit limit adjusted.

**ORDER ENTITY**
**(The Order Header)**

E7 — Order header accepted.
E8 — Cancelled order header removed.
E9 — Completed order header removed.
E10 — Order header cancelled.
E11 — Order header details adjusted.

**ORDER-PRODUCT ENTITY**
**(The Order Items)**

E12 — Order item accepted.
E13 — Cancelled order item removed.
E14 — Completed order item removed.
E15 — Order line cancelled.
E16 — Order line details adjusted.

**BACK-ORDER ENTITY**

E17 — Back-order item accepted.
E18 — Cancelled back-order item removed.
E19 — Back-order item removed.
E20 — Back-order item cancelled.
E21 — Back-order item adjusted.

**PRODUCT ENTITY**

E22 — Product accepted.
E23 — Discontinued product removed.
E24 — Discontinued product notified.
E25 — Product quantity issued.
E26 — Product quantity received.
E27 — Product details adjusted.

**INVOICE ENTITY**
**(The Invoice Header)**

E28 — Invoice header produced.
E29 — Cancelled invoice header removed.
E30 — Paid invoice header removed.
E31 — Invoice header cancelled.
E32 — Paid invoice header flagged.
E33 — Invoice header details adjusted.

**INVOICE-PRODUCT ENTITY**
**(The Invoice Items)**

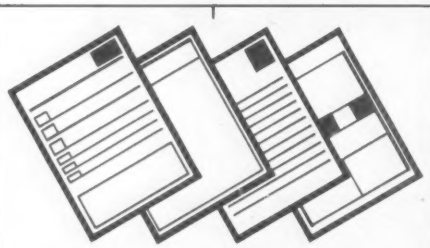
E34 — Invoice item produced.
E35 — Cancelled invoice item removed.
E36 — Paid invoice item removed.
E37 — Invoice line cancelled.
E38 — Invoice line details adjusted.

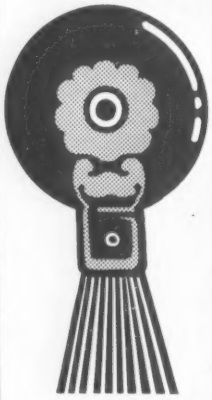
**DELETIONS LEGEND**

Remove: Physically delete.
Cancel: Logically delete: turn on cancel flag.

**Stage 3: Condition identification.** Conditions that must be satisfied *before* an event is executed may be im-

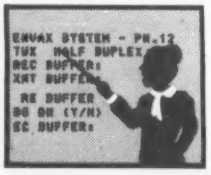

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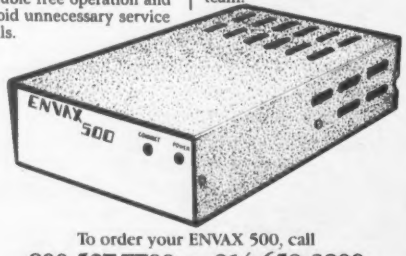



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portant. These are called "preconditions." Other conditions may only be capable of being satisfied *after* execution of an event and are called "post-conditions." Some events may need to be carried out repetitively. Conditions that must be satisfied for repetition are called "repetition conditions."

The combining of individual events in particular sequences, the conditions to be satisfied before or after execution of each event and the number of repetitions of specific events generally requires a good understanding of the functional area concerned — its responsibilities and objectives. Such an understanding would normally be held by user department and management personnel from that functional area.

### New Procedures

Procedure formation provides a new perspective for combining events into procedures. Existing procedures may be carried out for no reason other than that "they have always been done that way." By building procedures from data change events, new sequences and approaches will become evident. They may never have been obvious when viewed from the perspective of the previous procedures. Such new procedures may offer unforeseen benefits.

Some procedures used in a functional area (either manually or with automated systems) may need to be continued with any new system. Consequently, these existing procedures can be defined by combining relevant events in a sequence, based on conditions that are already known. Even so, this predetermined combination is used only later — to cross-check the derived procedures — so as not to interfere with the open-minded lateral thinking used during procedure formation.

### Consolidated Procedures

Procedure formation also offers an opportunity to consolidate procedures across different functional areas, where they in fact have the same job to do. For example, one large marketing organization was able to resolve the nine different procedures for receipting across its various departments. It consolidated them into two standard receipting procedures. Procedure formation, as a technique for deriving new procedures, can be highly significant in the new business opportunities that are opened up.

In combining events to form new procedures, we deliberately break away from the conventional step-by-step narrative description. We will instead use a graphics technique.

We will show events as ellipses and will join two or more event ellipses to show a particular sequence for executing those events. We call these diagrams "procedure maps."

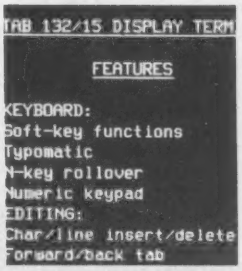
Although similar in appearance, procedure maps differ from structured analysis data flow diagrams in that we are not concerned with data flow. Instead, we are interested in events' sequence of execution and the conditions that dictate that sequence. This is called "event propagation." Arrowed lines are used to indicate event propagation.

Our objective in documenting events in procedure maps is to consider the business implications of different event execution sequences. Some event sequences may be invalid, such as the deletion of an order before its acceptance. Other event sequences may only be valid if certain conditions are observed.

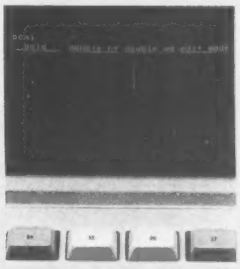
### Validation Events

Identification of conditions also leads to identification of validation events associated with retrieval (or read) of entities or data items. We

*(Continued on Page 38)*

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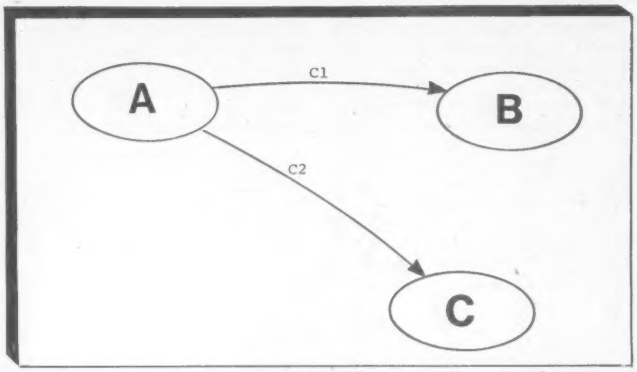



Figure 2. Schematic Representation of Events and Execution Sequence

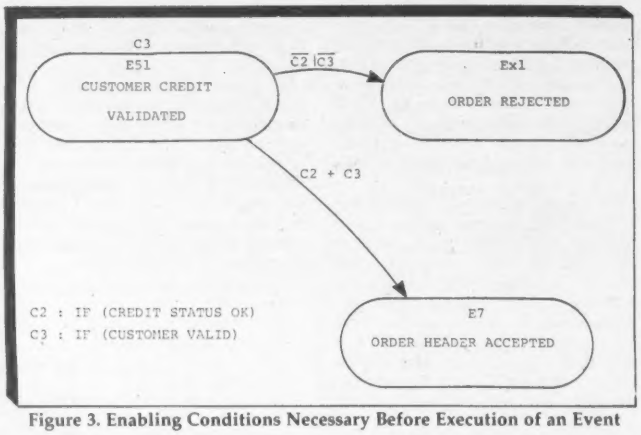



Figure 3. Enabling Conditions Necessary Before Execution of an Event

*(Continued from Page 37)*

will now consider this access to the data model, which we deliberately ignored earlier.

Appropriate validation events are identified and associated with conditions — either pre- or postconditions. These conditions become the hinge points or connectors linking events. Program specification synthesis subsequently reviews retrieve activity for inquiry or reporting purposes.

Where two or more alternative events can be executed in relation to a particular event, we will determine the conditions under which each of those event directions may be taken. We list these conditions in a conditions table (as either pre-, post- or repetition conditions), and indicate which are the pre- and postevents for those conditions. We will later use these conditions to develop procedure maps.

**Stage 4: Procedure derivation.** Figure 2 indicates that event A is executed first. Either event B or C is executed after event A. This is shown by a line joining events A and B and a line joining A and C. The arrow on each line indicates direction of propagation: Event A is executed first and events B and C are executed after event A. These lines are called "event propagation lines."

If event B must be executed before event C, then the event propagation line to event B exits event A above the line to event C.

Figure 2 shows a notation on each of the two event propagation lines. This notation is C1 on the line between events A and B and C2 on the line between events A and C. A bar above a condition signifies the "not" condition.

C1 and C2 are "event propagation conditions." These indicate particular conditions that must be satisfied before the succeeding event can be executed. Thus, following event A, event B is executed *only* if condition C1 is satisfied. Similarly, event C is executed after event A (and also after event B, as event C falls below event B) *only* if condition C2 is satisfied.

In some cases a condition must be satisfied prior to the execution of an initial event. For example, Figure 3 shows a condition (C3) above the Customer Credit Validated event (E51) ellipse. This condition checks whether the customer is valid and can therefore place an order with the organization. Such customer validity may be determined from a list of accepted customers or by a specific customer number, for example.

Condition C3, represented above the Customer Credit Validation event ellipse, indicates that a credit validation is only carried out if that customer is valid. If the customer is invalid, the order is rejected. Figure 3 shows that the negative conditions of either C2 or C3 can give rise to rejection of the order. These two negative conditions are joined by a vertical line. This vertical line represents "OR." Thus an order is rejected in Figure 3 if either the customer is invalid *or* the customer's credit status is not satisfactory.

On the other hand, two or more conditions may together need to be satisfied before a particular event can be executed. This is also indicated in Figure 3, where the customer must be valid *and* the credit status must be satisfactory before an order can be accepted. This "and" condition is indicated by the plus sign joining the two conditions C2 and C3 on the event propagation line between Customer Credit Validated and Order Header Accepted.

We have so far joined separate application events by event propagation lines, so indicating a particular

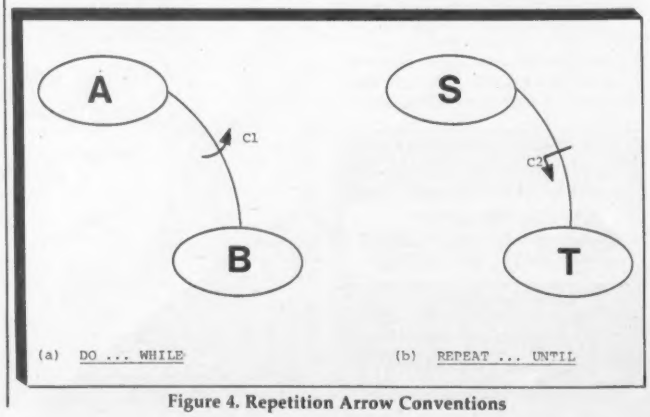
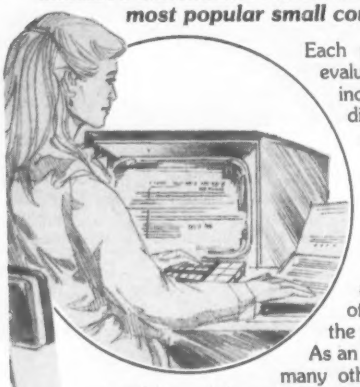



Figure 4. Repetition Arrow Conventions


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sequence of execution. We have also indicated that execution of a subsequent event may depend upon the satisfaction of one or more conditions. Alternatively, if no conditions are indicated on an event propagation line, the succeeding event is executed *unconditionally*. Once the first event has been executed, the following event is executed.

### Repetition of Events

We need to represent schematically one more factor that controls the execution of events: a repetition factor.

Two repetition arrow conventions are used in procedure maps. A curved repetition arrow implies a DO ... WHILE repetition, while a right-angle repetition arrow implies a REPEAT ... UNTIL repetition. These are illustrated in Figure 4.

Diagram (a) shows that event A is carried out first, followed by repetition of event B, based on condition C1. If C1 is immediately satisfied on the first test, event B is *never* carried out; otherwise event B is carried out repetitively while C1 is satisfied. This represents DO ... WHILE repetition.

Diagram (b) indicates that event S is carried out first, then event T is carried out *at least once* before condition C2 is checked. If C2 is immediately satisfied, event T is not repetitively carried out; otherwise event T is repeated until C2 is satisfied. This is a REPEAT ... UNTIL repetition.

As a series of events are combined, a complete procedure will evolve. Such a procedure may be carried out by a manual system or by computer in an automated system.

The derivation of a procedure map is an evolutionary process, combining events based on conditions and pre-events and postevents associated with those conditions. This process is highly repeatable and breaks away from the procedural constraints of the past to derive new procedures. These "new" procedures are then composed with the "old" procedures to identify business opportunities.

The evolution of procedures by combining events, together with the preparation of procedure maps, constitutes procedure derivation. Such "synthesized" procedures provide direct input to program specification synthesis.

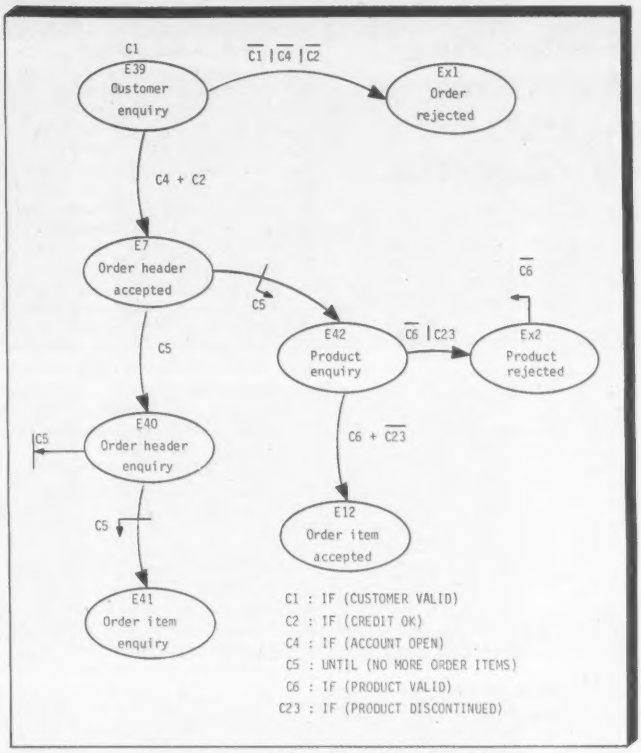



**Figure 5. Accept New Order Procedure Map**

We will illustrate the derivation of procedures, using as a basis the application events identified earlier in the event list.

### Orders Department Procedures

In forming procedures for the orders department, we can be guided by the data model and the business rules it expresses. (Data analysis discusses the derivation of a data model based on business rules.)

The business rules are expressed in Figure 1 and are illustrated primarily by the associations between the entities. Figure 1 shows that a customer may have one or many orders outstanding or none. However, each order relates (mandatorily) to only one customer.

Similarly, an order is made up of one or many order line items (ORDER-PRODUCT). However, an order cannot exist without at least one line item, and a line item must relate to only one order. Thus the association in Figure 1 between ORDER and ORDER-PRODUCT is a mandatory-one to mandatory-many association.

This therefore suggests that as an order must be associated with a customer, we should identify and validate that customer before accepting the order. Furthermore, as an order is made up of one or many order items, each order will result in repetitive executions of events that accept order items.

Figure 1 also indicates that an ORDER-PRODUCT has a mandatory association with one, and only one, PRODUCT entity. A PRODUCT entity may, however, be referred to by many order line items across many orders.

This suggests that prior to acceptance of an order item, the relevant product should be referenced to ensure that it is valid. This can be carried out through a product validation inquiry. If the referenced product is invalid, that order item must be rejected and a new order item (for a different product) accepted.

Following acceptance of the order and its associated order line items, final confirmation of that order can be provided through an order inquiry and an order item inquiry. Figure 5 illustrates a procedure map for the procedure discussed above.

Thus a series of new events based on retrieval (or READ) of entities are identified. They are added to the event list as we examine conditions under which propagation can occur between previously identified events and as we form the business procedures supporting the partitioned area being examined.

The new retrieval events are listed below. They are an extension of the previous entity list, and event numbers are allocated as shown.

**RETRIEVAL EVENTS**

E39 — Customer inquiry.
E40 — Order header inquiry.
E41 — Order item inquiry.
E42 — Product inquiry.
E43 — Back-order inquiry.
E44 — Invoice header inquiry.
E45 — Invoice item inquiry.

*(Continued on Page 40)*

```
IF (CUSTOMER INVALID)
  NOTIFY ERROR — CUSTOMER NUMBER INCORRECT
OTHERWISE (CUSTOMER VALID)
  CUSTOMER INQUIRY (E39)
  IF (ACCOUNT NOT OPEN OR CREDIT NOT OK)
    NOTIFY ERROR — ACCOUNT CLOSED OR INSUFFICIENT CREDIT
  OTHERWISE (ACCOUNT OPEN AND CREDIT OK)
  ORDER HEADER ACCEPTED (E7)
    REPEAT (WHILE MORE ORDER ITEMS)
      PRODUCT INQUIRY (E42)
      IF (PRODUCT INVALID OR PRODUCT DISCONTINUED)
        NOTIFY ERROR — INVALID OR DISCONTINUED PRODUCT
        BREAK — EXAMINE NEXT PRODUCT ORDERED
      OTHERWISE (PRODUCT VALID AND CURRENT)
        ORDER ITEM ACCEPTED (E12)
    UNTIL (NO MORE ORDER ITEMS)
    ORDER INQUIRY (E40)
    REPEAT (WHILE MORE ORDER ITEMS)
      ORDER ITEM INQUIRY (E41)
    UNTIL (NO MORE ORDER ITEMS)
```

**Figure 6. Structured English Version of Procedures**


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*(Continued from Page 39)*

**Stage 5: Procedure expression.** This stage documents the procedure maps derived during Stage 4 in a form acceptable to the organization. Two examples are given: narrative procedure documentation and user-oriented structured English documentation.

Figure 5 (on Page 39) illustrates the following procedure statement, expressed in a narrative form:

If the supplied customer is valid, the customer's account is open and the credit status is satisfactory, an order header may be accepted from that customer. Otherwise the order is rejected (Ex1) if *any* of these conditions are not satisfied.

That order is made up of order items, each of which nominates a particular product. If the product number specified is valid and that product has not been discontinued, the order item is accepted. If, however, the product number is invalid or the product has been discontinued, the order item is rejected and a new order item may be supplied. Figure 5 represents this with a BREAK right angle arrow exiting from the error event Ex2 following event E42.

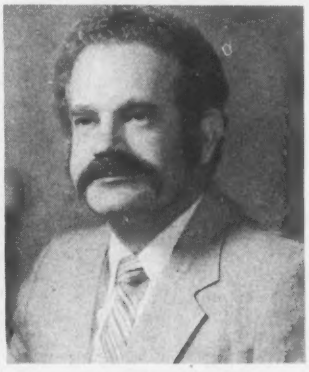
This continues, accepting each order item in turn until there are no more items making up that order. Figure 5 illustrates this with a right angle arrow to represent repetition of order item acceptance. A confirmation of order acceptance is then provided by an order inquiry, made up of an order item inquiry for each item within that order (indicated by further event repetition in Figure 5 and a blocked exit arrow from event E40 when there are no more order items).

This procedure is expressed in a procedure statement based on user-oriented structured English in Figure 6 (see Page 39). This was derived directly from the procedure map in Figure 5, with relevant event numbers indicated in brackets.

Figure 5 illustrates repetition following event E7 (order header accepted). The repeated events are E42 (product inquiry) and E12 (order item accepted). This is indicated in the coding above by the procedure statements between REPEAT and UNTIL (NO MORE ORDER ITEMS.)

In the event of a product error, the processing of that particular order line item is terminated; this is indicated by the BREAK statement in the code within the REPEAT loop (derived from the BREAK symbol exiting from the error event following event E42 in Figure 5). There is an additional repetition after event E40 (order inquiry) of event E41 (order item inquiry). This is indicated by the REPEAT . . . UNTIL (NO MORE ORDER ITEMS) statements at the end of Figure 6.

*Next week: The interfaces between information engineering and software engineering, business systems planning, decision support systems, data dictionaries and systems development methodologies.*



*Clive Finkelstein has spent 20 years in DP, 15 of which were with IBM in the U.S. and Australia. He founded Infocom Australia in 1976.*

*His firm is now known as Information Engineering (Aust) Pty. Ltd. and has subsidiaries in New Zealand and the U.S. The latter, known as Information Methods (U.S.A.) Corp., is located in Boston.*

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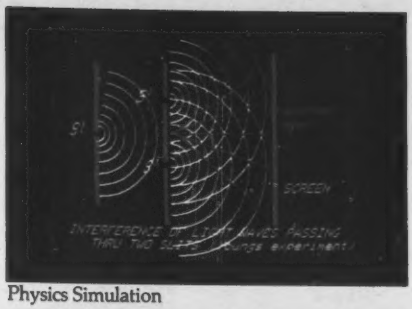
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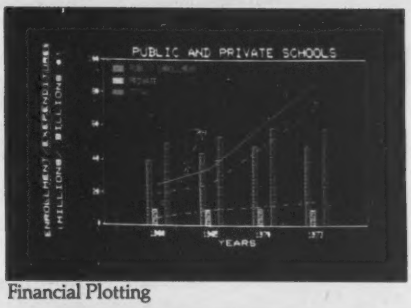
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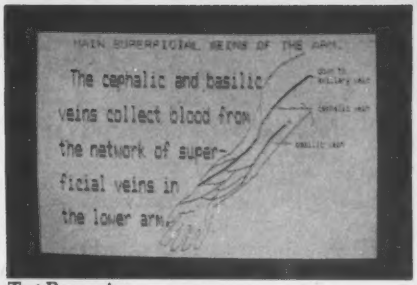
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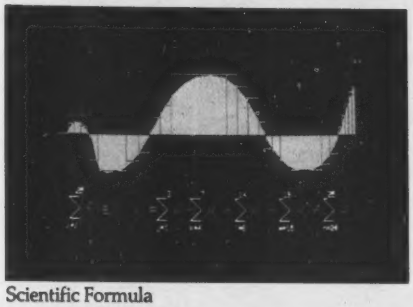

Physics Simulation



Financial Plotting

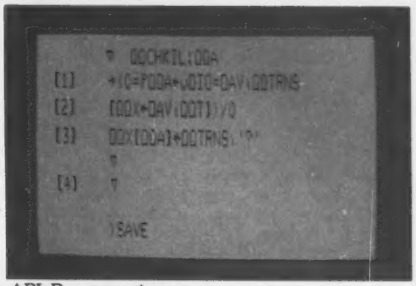


Text Processing

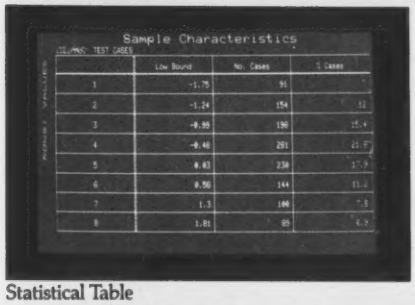

Scientific Formula



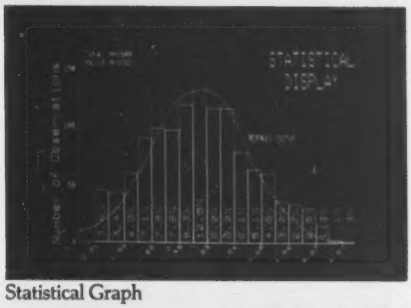
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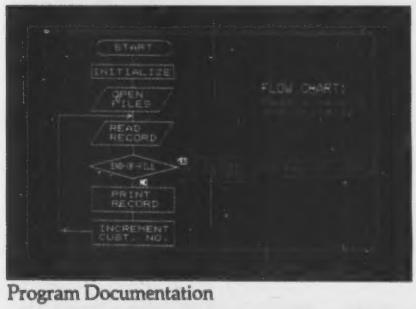
APL Programming



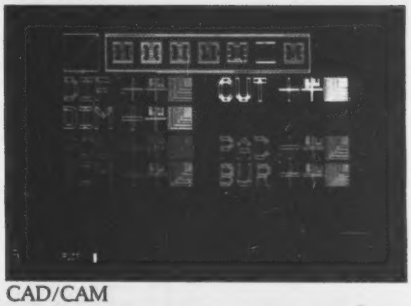
Statistical Table



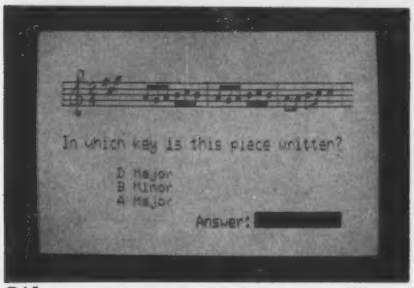
Statistical Graph



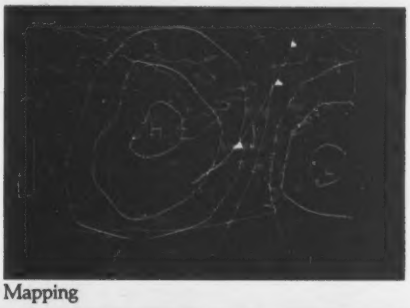
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# EDITORIAL

## New Slant to Jobs Picture

The DP job market could be substantially affected if Congress agrees to President Ronald Reagan's proposed increase in military spending over the next five fiscal years.

The proposed $181 billion hike would be triple the increase experienced during the Vietnam War's peak five years, adjusted for inflation since then, according to MIT economist Lester Thurow. In a recent article, Thurow argued that such acceleration of military spending would draw hotly demanded DP professionals from many industries to those industries serving the military, such as aerospace.

Further, the migration would come while Japan leaps forward among nations as a DP supplier, Thurow asserted. Japanese vendors — including Fujitsu, Ltd., Hitachi and Matsushita — are already gearing up for major thrusts into America's DP market.

Will domestic vendors meet this challenge successfully if the bulk of top-quality DP specialists go for top-dollar salaries in military-related industries, rather than serve the computer industry? Maybe not, Thurow suggested in the May 14 *New York Review of Books*.

In his article, the economist failed to mention another factor exacerbating the problem of scarcity in the DP job market: the nation's diminishing capacity for training DP professionals. This results from the migration of computer scientists, and others qualified to teach DP, from academia to industrial research centers.

That migration is quite similar to the migration Thurow anticipates among DP professionals should the Reagan military buildup proceed. Computer scientists are leaving academe for much higher salaries, superior research facilities and freedom from teaching obligations, according to The Computer Science Board, which represents North America's academic departments in the discipline.

The same incentive could obtain if military-oriented companies receive the billions of dollars Reagan has claimed should be spent — allegedly because the Soviet Union has outspent us in military development and now ranks superior in certain aspects of capacity for war.

That rationale has been seriously challenged. But while many military experts debate the Reagan administration's arguments for the spending hike, it does seem unlikely that Congress will disappoint Reagan very much.

According to a number of investigative reports by federal watchdog agencies, the armed forces do suffer from obsolescence in computer systems as well as a dearth of personnel qualified to manage systems appropriately. Hence, the military will probably feel compelled to increase its dependence on industrial computing expertise and resources, independent of congressional will.

Those sensitive to changes in the DP job market should plan accordingly.




*The Optimist*

# DATA PAST

### Five Years Ago
### June 7, 1976

NEW YORK — Sperry Univac introduced its large-scale virtual 90/80 system designed to provide an upgrade for existing Univac and IBM 370/145 sites. The 90/80 was the first Univac mainframe to use emitter-coupled logic circuitry.

— — —

NEW YORK — A federal judge rejected as "frivolous" and "not persuasive" IBM's arguments against the government's use of Federal Bureau of Investigation agents to interview IBM trial witnesses in the antitrust suit against the firm. The government planned to use the FBI to interview 131 of IBM's 400 trial witnesses.

### Ten Years Ago
### June 9, 1971

MIAMI — Eastern Airlines tried to win a tax rebate by proving in court that IBM's pre-unbundling software and support were actually worth 55% of the catalog price of its system.

# LETTERS

### CW Fine as Is

D.L. Campbell's suggestion that *Computerworld* is too large [CW, May 25] is akin to saying that the public library card catalog is too large. Even the big May 4 issue (which was, in fact, 240 pages rather than 184 pages long) could be skimmed in five to 10 minutes. After that, it is up to the individual reader to decide which articles and advertisements to read.

CW's increasing coverage of the returning involvement of end users of data in the data management process demonstrates the need for more generality and practicality in DP literature, not more specialization and arcane technological detail.

If CW were split into several specialized publications, there would be much inevitable duplication among them, both in editorial and advertising content. Many of us would be obliged to subscribe to them all in order to keep up with rapidly developing cross-specialization, and skimming several partially redundant publications would take much longer.

CW should consider changing its binding to bundled signatures, producing a flat spine, as *TV Guide* has recently done. However, for my money, let's leave the editorial and advertising policies as they are.

Richard H. Young
R.H. Young Associates
Portsmouth, N.H.

### Creativity Not Enough

Programmers who create individual pieces of code that are short-lived in usefulness and impossible for those who follow to maintain are not contributing to the long-term success of a company.

Many creative people will sympathize with Arnie Wernick's reaction to the use of strong-arm tactics in directing information systems development ["Formula for Development Success Exists," CW, May 25]. Few will recognize that these tactics are themselves a defensive reaction to out-of-control "creativity."

Creativity alone will not ensure the success of a development project. To be productive, creativity must be tempered with wisdom, qualities that are not frequently found in the same individual. The resulting separation produces a necessary tension, sometimes misunderstood, between the creative and controlling contributors to the success of a project.

Experience in managing highly complex projects is revealing that structuring the problem and the solutions to the problem frees the creative individual from difficulties in defining his own role and in communicating with other contributors. Freeing him from having to deal with too many variables permits him to focus his energy on the problem.

L. Kurt Engelhart
Principal
L.K. Engelhart Associates
San Francisco, Calif.

### DPMA Has Ethics Code

James R. Shannahan ["Code of Ethics," CW, May 25] needs to be better informed. The Data Processing Management Association (DPMA) is proposing a new code of ethics for its members. I have on my wall a membership certificate from both DPMA and its predecessor, the National Machine Accountants Association (NMAA). Both display our code of ethics. The dates: 1958 and 1961.

Yes, Mr. Shannahan, imitation is the sincerest form of flattery.

John D. Ferguson
Past President
Louisville Chapter, DPMA
St. Meinrad Archabbey
St. Meinrad, Ind.

READER COMMENTARY John Nemec

# Managers' Balancing Act: Organization, Motivation

Efficiency with objective management has several sides. Managers must use logic when motivating the team as an organized unit, and problem solutions can be varied. Brainstorming often provides a creative answer that works better than a sentimental past formula.

What makes a person a data processing expert who has the respect of his associates? Some measuring rods include knowledge of each new trend in systems technology, the ability to analyze an installation for results and the quality of a person's general knowledge about computer limitations.

Managers often approach administration with planned detachment. Yet they must keep in mind that their subordinates can contribute to innovation. In addition, managers should work hard at technical mechanics and review the company's functional skeleton as it affects expectations for the department.

Objective leadership colors the four usual methods for evaluating employees: review by managerial committees, a specialist group from outside, an immediate supervisor or appraisal by a person's colleagues. The last technique has the shortcoming of personal involvement.

### Final Goal

The goal of a procedures or systems group is to process a unique application successfully. A system must be designed with the right sequencing of electronic, mechanical and/or manual procedures.

At times, a manager may feel unable to clear up a design dilemma. It could produce conflict and anxiety over running his own routine. A good approach is to set the problem aside to let it cool, then turn to other areas. This lull might help unearth the solution when he confronts the problem again. We should always follow the "cool deliberation" policy when possible.

When organizing their units, systems managers must recognize and harness both exterior and internal activity, especially as the former relates to the organization itself. Attaining objectives often depends on how well the formal social framework can be understood. But a manager also ought to spend time with vertical contacts. This will improve results because association with one's superiors should provide inspiration. The average golfer who practices with scratch players often lowers his score.

While the manager tries to organize for better morale, he should aim at avoiding favoritism. Employees who feel left out may lose a sense of security as production cogs in the machinery.

Another long-term aid to morale is the intelligent alignment of aisles, furniture and office equipment. Building space needs to be laid out with maximum functionality in mind.

The company reaches its goals more directly through teamwork. Cooperating horizontally with equal-level

(Continued on Page 46)

READER COMMENTARY/Barry Bogart

# APL Makes Powerful Modeling Tool

I wish to respond to some comments about APL which appeared in the excellent article on computer models by Martin Collins and John MacGregor [CW, April 20].

The comment was made that, "Its general use is likely to be restricted because it is based on special characters that are not easily understood by the average financial planner." The "special characters" used by APL are simply a concise version of the "verbs" or built-in functions used in all other languages and packages. Those that are relevant to the problem to be solved (always a small subset) must of course be learned as with any other language. Once they are learned, however, the user has a powerful tool he can use for a very wide variety of modeling and analytical applications.

It is somewhat unfortunate that APL's character set does require special hardware, because of many technical considerations. The effect of APL's uniqueness is that one tends to get totally involved with it, or not at all.

The article went on to state that with APL in its raw form, the user has to program all his routines. This deserves two comments. For one thing, some modelers want to take personal responsibility for the computational methodology employed. This is really only feasible with APL. Second, there are many good planning packages written in APL which are available, so there is little need for use of raw APL. On the other hand, the source code of most of these packages is visible to APL users so that they can be used as "glass boxes" to be modified or merely understood by the user who knows APL.

The article also drew attention to the interpretive nature of APL. There is, of course, a benefit side to this matter, that is, interpretation greatly facilitates debugging, for example. But more to the point, iteration, which should be avoided in APL, is happily usually easy to avoid because of APL's array-processing capability. The example given in the article was solving simultaneous equations, but any APL user knows that systems of simultaneous linear equations can be solved with a single keystroke, using a hard-coded algorithm which is probably as efficient as whatever is used with Fortran or PL/I.

Another point is that APL interpreters have become very sophisticated in terms of precompiling an APL program as much as possible after definition. After all, most parts of common APL programs cannot dynamically change during execution, so they can be precompiled to executable form at one time only.

The result of the array-processing and precompiling factors is that for appropriate tasks, APL efficiency approaches that of compiled languages and exceeds some generalized packages.

*Bogart, a holder of the Certificate in Data Processing, lives in Vancouver, British Columbia.*

HUMAN CONNECTION/Jack Stone

# NCR Users Put Spotlight on Productivity

DP productivity has been the subject of a lot of talk lately, but at least one organization is taking decisive action and addressing the problem head-on: the Federation of NCR Users Groups (Fnug). For example, the theme of its 11th annual conference, Nucon: 81, held in Hollywood, Fla., recently, represented a refreshing change from those conferences dealing with well-worn areas of technological developments. Nucon focused on "Education: The Path of Effective Productivity."

This choice of theme suggested that, insofar as NCR users were concerned, the overriding problem today relates to DP personnel and how to hire, train, assign tasks to, motivate and lead them. And many of the sessions supported the theme; they had such titles as "Human Resource Growth and Training," "Human Resource Management and Data Processing" and "Cost Justifying Education."

And I was further impressed with NCR's representative, Mike Pekarek, from NCR Corp.'s Speaker's Bureau in Dayton, Ohio, who was invited to keynote the conference and chose the topic "Motivating the EDP Professional." His presentation left the impression that NCR recognizes the depth of the personnel problem and is committed to provide some assistance in that area to its customers.

In this article, the first of two on the conference, I will discuss the essence of Pekarek's presentation. Next week, I will summarize my interviews with officials of Fnug concerning their views on NCR user achievements and what the future holds in store for them.

### Crisis Situation

Pekarek began by noting that DP personnel turnover has reached crisis proportions. He cited a prediction that one out of every three DPers will change jobs this year. Then he suggested that DPers job-hop not solely for increased salary — a factor which is most significant at hiring time — but also for these reasons:

- To gain new skills and experiences.
- To improve their own productivity capabilities.
- To increase their marketability.

He cited results from research efforts that have identified key motivational factors that apply to most people involved with high-technology developments, factors which would tend to breed job satisfaction — and, therefore, organizational longevity. Briefly stated, they are:

1. Skill variety. The job must provide a variety of activities that significantly challenge employee skills and abilities.
2. Task identity. A particular task is perceived and accepted by the employee as part of an entire project or program.
3. Task significance. A task has significance to the employee relative to its impact on the lives of other people.
4. Autonomy. The employee has the freedom to complete the task without excessive supervision.
5. Feedback. The job is designed as to show the employee how well he is accomplishing his assignments.

He went on to say how a job with a high motivational content tends to build job satisfaction through the development of three psychological states:

- Experienced meaningfulness: created from skill variety, task identity and task significance.
- Experienced responsibility: created from autonomy.
- Knowledge of results: created from feedback.

According to Pekarek, research has indicated that, generally speaking, DP professionals have a lower social need and a higher growth need on the job than do other professionals and that the types of jobs available in computer centers provide good matches for DPers.

Finally, Pekarek identified five areas of activity which, if well executed, will tend to improve the motivational level of DPers.

- In-house training covering technical, professional and managerial subjects.
- Training courses in communication skills including effective writing, speaking and how to listen.
- Career development programs covering career paths for all employees, ranging from entry level to senior management.

Bilateral communications throughout the organization show DP professionals that there is something beyond DP.

- Job redesign and enrichment techniques to make the job more interesting and challenging.

# LETTERS

## Employer Strategies

I would like Arnold Berger to know that there is a very real — though not competitive — employment market for Cobol programmers at $90 or less per day worked, inclusive of benefits and occupancy ["Retirees as Resource," CW, May 25]. He might ask to see listings at a state employment office.

To establish a noncompetitive employment market, employers with a common interest (such as their industry) will define standards of comparability for similar positions. They will discover if there is any good reason they are paying more than (or less than, or the same as) other employers who are similarly interested. They will independently act in their own business interest to remove what they consider to be inequities.

Employers will seek to perpetuate an artificially low salary schedule by promoting from within. It insulates them from competitive market factors which would nudge the schedule upward, starting at the lowest rung of competitive hiring.

Employers will budget carefully. If inflation is expected to be at 12%, allocations for salaries might increase by 7%. In order to reward selected employees adequately, it will be made to seem that other employees are not meritorious. You can bore some employees to death, you can criticize others and put those criticisms in the record of employment, or you can tell someone to keep patching a 10-year-old program that was never properly organized or maintained. (But don't let him rewrite it. Tell him the user won't pay for it.) Surely there are additional ways to destroy initiative and morale.

(The fallacy in defining salary structures and grade levels is in the assumption that there are sufficient qualified applicants at the stated salary. This being untrue in programming, recruits are fed in at the bottom of the employment stream. Some sink or are made to sink. Some swim, and this fact "shows" that the system is valid. So when you sign on with a new employer, get a salary margin of error in your favor. The system doesn't allow you to renegotiate.)

When an underpaid employee goes on the market, can he say how terrible his previous employer was and use that as justification to ask for more elsewhere? Not on your life, Charlie Brown. Employers have their pride, too. They know more about other employers than they know about you, so why should they take your word for it?

It is true, the competitive sector of the employment market does exist, where it costs $120 to $150 per day worked to support a Cobol programmer employee. But even if we of the lower tier are not part of it, we can be thankful it exists. Without it, we would be as badly off as nurses and teachers.

[Name Withheld by Request]
Massachusetts

## Troubles With Mumps

James M. Pearson's letter exclaiming his success with Mumps [CW, March 30] came as quite a surprise to us here at UMass Medical Center.

We have been running a supposedly advanced version of Mumps (called ISM), and just went through 52 consecutive days (from March 28 through May 19) of daily machine crashes, repeatedly breaking file pointers along the way — continual bus error crashes, IL errors (whatever they are) and frozen global module.

Help! What can a user do in a situation like this?

Charles Volkstorf
Biomedical Computing
University of Massachusetts
Medical Center
Worcester, Mass.

## Removing ALTERs

We completely agree with the point made by Terrence W. Halloran in his letter concerning the solution to the problem of the ALTER verb [CW, May 11]. His suggestion was to automatically remove the ALTER and replace it with "vanilla" Cobol.

As a standard feature, Progeni Tools offers the automatic removal of ALTER statements. Similarly, our tools can be used to automate the conversion to Cobol-81.

This is just one example of the tools that we have available to boost programmer productivity on Burroughs Corp. equipment.

Murray R. Mann
Consultant

Progeni Systems, Inc.
Glendale, Calif.

*Computerworld* welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters should be addressed to Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.


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# LETTERS

## Nothing New

Thank you for saving me the price of James Martin's new book. The excerpt printed from it in the May 4 issue contained nothing new and/or startling.

Heavy end-user involvement is a principle I learned in 1951 and have incorporated in my lectures since 1971.

Daniel F. Brooks
Director of Projects
Special Programs
Professional Services
Operations West
Informatics, Inc.
Palo Alto, Calif.

## Making the Leap

After seeing several articles and letters recently warning of problems concerning the coming turn of the century, I feel I must clear up the common misconception that 2000 is not a leap year. The proper method of figuring leap years is this: If the year is evenly divisible by 4 and is not evenly divisible by 100, it is a leap year. Or if the year is evenly divisible by 400, it is a leap year.

A couple of quotes concerning "century years":

"Those which were divisible by 400 were to be leap years. All others were to be ordinary years, such as 1700, 1800, 1900. The years 1600 and 2000 are leap years. Outside of centurial years, all other years keep to the simple four-year rule as prescribed by Ceasar. Thus three leap years are dropped out of every 400 years" (*Of Time and the Calendar* by Elisabeth Achelis).

"In century years that cannot be divided by 400, such as 1800, 1900 and 2100, the extra day in February must be dropped. The year 1600 was a leap year and the year 2000 will be one (*World Book Encyclopedia*, 1978).

Since the four-year rule works well enough until 2100, we might as well use it.

I would like to offer *Computerworld* readers a set of date routines I coauthored. Written in Cobol, they do the following functions:

1) MMDDYY to Julian (YYDDD).
2) Julian to MMDDYY.
3) MMDDYY to day of week.
4) Edit MMDDYY for validity.
5) Alter MMDDYY (for example, what date is 180 days from 5/30/81?).
6) Difference of two dates (how many days between two dates?).

Note: five and six are accurate as long as they are used for dates between 1900 and 2100 (my code thinks all century years are leap years).

These six are also supplied for dates in YYMMDD format.

I'll throw in a couple more to concatenate and center strings.

Anyone interested can contact me at 9556 Phinney Ave. N., Seattle, Wash. 98103.

Erik Brooks
Seattle, Wash.

# A Question Of Balance

*(Continued from Page 43)*

people should simplify this theme. For motivation, one often looks beyond wages toward incentives like more status or the knowledge that he is helping build the organization.

### Methods of Control

Many top control specialists say they arrange the hierarchy so that every person reports to one, and only one, superior. A leader finds himself concerned with specific methods of controlling. He reprimands an errant worker privately, for example, rather than cause a dramatic scene where humiliation in front of others could deepen employee resentment. He should do whatever is required to keep the department functioning in unison.

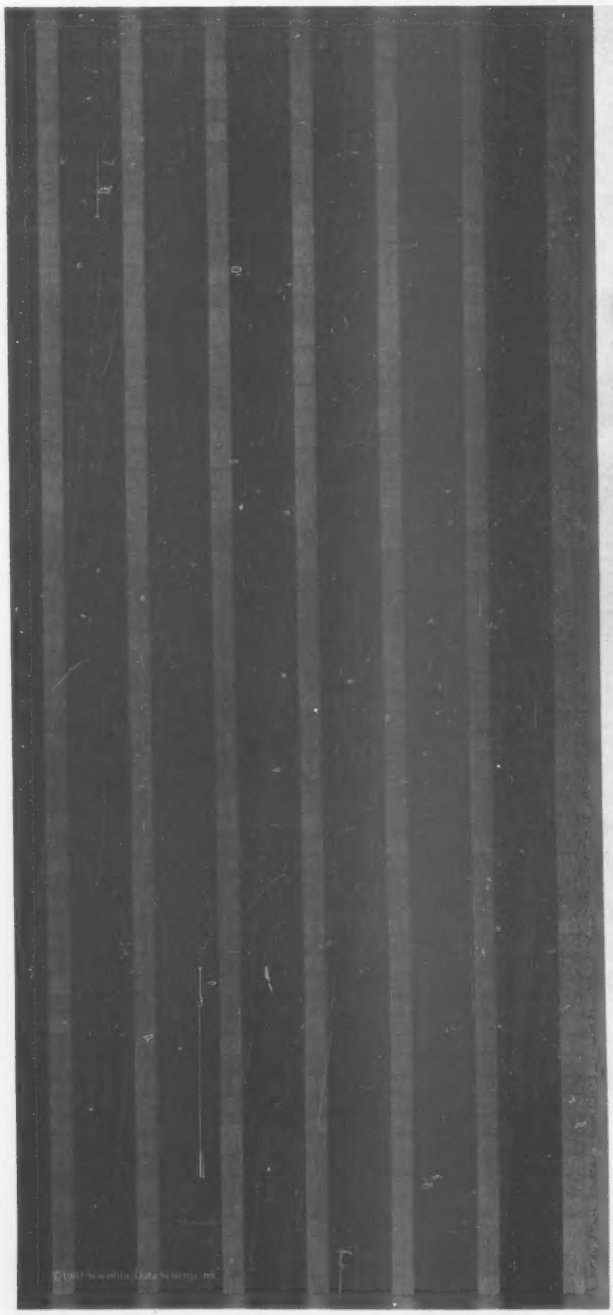
Vital decisions are usually sought from the manager at times when a procedure breaks down and an exception is demanded. If any change is considered, the manager should handle worker resistance through negotiation, which could involve giving them a role in decisive meetings.

Supervisors reporting to the manger should be allowed to participate in project evaluation. They, as well as programmers and systems analysts (though more indirectly), can contribute solutions.

But there is a pitfall in the paternal, or harmonious, approach toward management. People-oriented motivation often bypasses logical goals just because the staff strives so hard for togetherness.

Remember, the systems manager's task is the production of an integrated data processing system which reaches definite targets. In reaching the organization's goals, the manager should attempt innovation and blend in some reasonable incentives, bearing in mind that money is only one motivator for employees.

*Nemec is a free-lance writer based in Bridgeport, Conn.*



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## What to Do If Software Falls Into Hands Of Your Rival?

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — One of your ace programmers recently developed a proprietary software package for your widget manufacturing company's own internal use. The package significantly streamlines your firm's internal operations and is regarded by top management as a corporate secret because it gives your company a competitive edge over rival widget makers.

However, just a few months after its development, the software somehow falls into the hands of your leading competitor, which reaps tremendous dividends from your product and negates your company's former competitive advantage. Can your firm prove in a court of law that its trade secret was misappropriated and enjoin the competitor from further use of your proprietary software package?

The answer to that question is highly problematic. Most software theft cases are almost impossible to follow without an extensive knowledge of obscure technical jargon and a fine understanding of complex computing concepts.

If such cases were usually decided by seasoned computing professionals, the task of sifting the truth from the welter of conflicting legal claims might not prove so difficult, nor the outcome so predictable. However, the fact of the

(Continued on Page 50)

## Optimizer Cuts Overhead Of CICS, IDMS-DC

LOMBARD, Ill. — Formula/1, an optimizer of load modules that reportedly improves the performance of IBM's CICS and Cullinane Database Systems, Inc.'s IDMS-DC telecommunications monitor transactions, was introduced here by DBMS, Inc.

The product is said to eliminate more than half of the system overhead through which CICS and IDMS-DC handle and manage application modules. The improvement is reportedly measurable in CICS or IDMS-DC application processing. In addition, no changes to CICS, IDMS-DC or the user application program are required.

This process is achieved through a data base management system optimization technique that reduces the amount of time telecommunications monitors spend in handling user application modules, including subschemata, data base procedures, maps and programs, the vendor said.

A one-year license for Formula/1 costs $5,500, with renewal available for $1,100, the vendor said from 33 W. Roosevelt Road, Lombard, Ill. 60148.

## Relational DBMS Helps Firm Sift Census Data

By Lois Paul
CW Staff

DENVER — A small company here is using the tons of population, economic, labor statistics and other data produced by the government each year to create information systems for its clients that assist their management decision making.

The company applies relational data base management systems (DBMS) and nonprocedural languages to census-based data to help companies determine the best place to establish a new franchise and to assist hospitals to identify prospective patients and market their services.

Demographic Information Services and Census Utilization Systems (Discus) was formed two years ago by K. David Prince, a former demographer for the state of Colorado. "The original thrust was to take the knowledge we had in terms of what data was available and work with clients on a job-by-job basis to help them extract information from these sources," Prince said.

### Internal Problems

The company found that its clients had enormous internal problems handling their own data. One hospital had three different physician rosters with conflicting information, and each claimed to be the updated listing. "We found ourselves more and more involved in data base consulting services," Prince said.

Currently, Discus is using United Computing Systems, Inc.'s time-sharing service, although part of its long-term business plan is to purchase computer equipment.

The firm uses National CSS, Inc.'s Nomad DBMS, although

(Continued on Page 48)

## Syncsort Sort/Merge Fits VM/CMS

ENGLEWOOD CLIFFS, N.J. — A sort/merge program for IBM VM/CMS operating systems was announced here by Syncsort, Inc.

Syncsort CMS reportedly incorporates sorting techniques and internal algorithms employed in the vendor's sort/merge products for OS and DOS systems.

It was designed to process CMS, Vsam, tape and unit record files for input and output, and native OS and DOS Sequential Access Method files for input. User exits also are supported, the vendor said.

### Program Languages

Syncsort CMS is said to be compatible with OS or DOS invoking programs written in Cobol, PL/I or assembly language. In addition to sorting, the product can allocate disk sort work space for primary and secondary allocations, according to Syncsort.

A virtual storage management system reportedly has been incorporated into Syncsort CMS that adjusts virtual storage based on the system paging rate. The product also includes control card specifications for input record selection, record reformatting prior to output and record summation, the vendor said.

Syncsort CMS is licensed at $6,200 for three years or $3,000 for one year, the vendor said from 560 Sylvan Ave., Englewood Cliffs, N.J. 07632.


# CW Reports IBM's RMF & SMF Insufficient. QCM Needed!

**5/11/81**...At NCC, Michigan Bell's Phillip F. Curtiss claimed, for capacity planning, "IBM's RMF & SMF based systems don't offer enough information...to make accurate predictions on future CPU utilization." Also, "I/O utilization is equally important as CPU."

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**BCO-BYTE/SIO Counting Option:**
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### SDSI-Shared Data-Set Integrity

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## 'Guardian,' 'Interest' Updates Support IBM Mainframes

RIVER EDGE, N.J. — On-Line Software International, Inc. announced Version 1.2 of its Guardian on-line security system and Version 2.2 of its Intertest interactive testing and debugging facility.

Under Release 1.2, Guardian supports IBM's CICS Release 1.5 for both OS and DOS environments and offers users a log report generator to provide customized log reports through the system's English-like language, the vendor said.

Version 2.2 of Intertest reportedly offers programmers a Use Density feature and supports the Symbolic feature for DOS Assembler users. The Use Density feature enables the programmer to learn where execution time was spent within a program.

A Follow feature has been added to enable Intertest to follow program execution into other software systems to continue controlling programs. This feature is said to support software systems with nonstandard interfaces, such as IBM's Display Management System.

Both Guardian and Intertest are available to users of IBM mainframes or compatible systems. Guardian is sold through a permanent license for $18,000. Intertest is available on a permanent license for $16,000 until Aug. 1, when it will go to $18,500, the vendor said from 65 Rt. 4 E., River Edge, N.J. 07661.

# Discus Sifts Census Data For Firms' Decision Making

(Continued from Page 47)

Prince noted that Discus is geared to the relational DBMS concept and is flexible regarding the actual system used.

Prince said relational DBMS is a powerful concept that he views as an applied set theory. A data base with 20 items has the potential of yielding more than a million distinct subsets of information using a relational DBMS, he explained.

"This means you have an extremely powerful tool that is only limited by your own creativity," he said.

There is no in-house software development at Discus, although the company does develop its own specifications. It has used Nomad and Tandem Computer, Inc.'s Encompass distributed DBMS. Prince expressed some disappointment in other systems in terms of their reporting capabilities.

"University Computing Co. has a relational data base package, but the report generator capability of the package is quite limited in terms of other manipulations you might want to do with the data," he said.

The company's major market is hospitals and franchise chains. For the latter, sales data on franchise and company operations is linked by geographic coding sites. Discus conducts a market share analysis, using economic data and sales analysis using population characteristics.

"If a client wants to penetrate a market, we can look at the feasibility of the location selected. Then, once we have determined, for example, that he can support six to eight units, we look at the potential sites. We create models and do rank ordering based on potential sales," Prince explained.

### Prototype Systems

Originally, Discus conducted its research on a per-job basis. Currently, the company is looking into the opportunity for a subscriber-based service. "We have some prototype systems we developed to help our clients retrieve information in the forms they want," Prince said.

Discus is putting together a business plan and investment proposal. "We feel there is a great potential market," he said, noting that the company has no direct competitors in the Denver area.

Discus is moving from its specific area of using census-based data to a more general type of consulting and, when feasible, the company will take one further step. "Instead of just generating reports, we plan to use the data in conjunction with statistical packages and mathematical modeling," Prince said.

"When I look at the data, I see much more than raw data," Prince said. "I see the potential for mathematical modeling and trend data analysis."

Discus plans a hospital subscriber service. It attempted this a year ago, going through the private offering process without being able to generate enough interest locally. "We then dropped 10 yards and are punting," he said.

The company is rewriting its business plan to incorporate this idea and is in touch with business consultants.

## Directory Lists Unix, C Products

EAST HANOVER, N.J. — Infopro Systems is offering an industrywide directory of products for the Unix operating system and the C programming language.

The directory covers a variety of topics, including C compilers and interpreters, user groups, software tools, hardware vendors and full-screen editors, the vendor said.

The directory costs $18. The vendor may be reached through P.O. Box 33, East Hanover, N.J. 07936.


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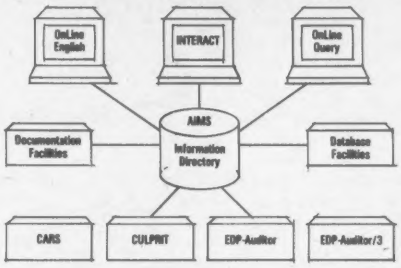
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**1.** Vendor Record: Cullinane Database Systems, Inc., is the most financially successful database software company with the best growth record and highest earning rate of all software companies. As a result, in 1978, Cullinane was the first computer software company in ten years to have a public offering, thus providing substantial financial resources for product enhancement, new product development, and company operations.

**2.** Audit Control and Integrity: The Information Directory (ID) is the control center for AIMS. Directory contents are automatically updated, assuring accuracy and consistency of all data resources. The ID also sets standards for data names across all systems, programs, and files, facilitating communication between data processing and end-user departments. Furthermore, the ID maintains relationships between systems, users, programs, and data elements, providing a monitor for the impact of proposed design changes on the system.

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# Audit Software: Cullinane

# 'Toolkit' Supports HP System Programmers

SEATTLE — The Programmer's Toolkit, a collection of software tools designed to enhance the productivity of programmers on Hewlett-Packard Co. computers, was unveiled here by Walker Richer and Quinn, Inc.

The Toolkit provides tools in four basic areas. The most elaborate, according to the vendor, concerns table creation and manipulation. This group is oriented toward storage and retrieval of data records that contain a symbolic key.

It includes an improved buffering arrangement for use with frequently accessed external tables and an internal table sort utility. Usage is similar to the access methods normally found in a data base management system such as HP's Image, the vendor said.

### Manipulation Procedures

The Programmer's Toolkit also is said to provide a collection of procedures that manipulate a string data type.

These routines reportedly correct the deficiencies of programming languages such as Cobol and Cobol II, which do not support variable-length character strings.

A third class provides a Control-Y interrupt on a systemwide rather than custom-coded basis that allows the programmer to extend the Control-Y trap features into any program by calling an intrinsic, the vendor said.

The final set of intrinsics concerns data transformation routines for the site that lacks a standard package. These enable the programmer to make reference to the HP 3000 internal date format within each program, according to the vendor.

Each tool is equally callable from Cobol, Cobol II, Fortran and HP's Systems Programming Language, the vendor said, noting that any program can use the instrinsics.

The Programmer's Toolkit is available on a 1,600 bit/in. tape or diskette for a one-time license fee of $500.

More information is available from the vendor at 3429 Fremont Place N., Seattle, Wash. 98103.

# Software Theft Hard to Prove

(Continued from Page 47)

matter is that the resolution of practically all trade-secrets theft cases is left to the discretion of lay jurors and judges, who have virtually no grasp of even the most elementary computing principle or terminology.

Thus, plaintiffs who plan to go to court to prove misappropriation of proprietary technology had better come to grips with a sobering realization: The issue of who owns and gets to keep a disputed trade secret will ultimately be settled by people who are thoroughly unqualified to decide such matters. So warned Ronald Johnston, a partner in the Los Angeles-based law firm of Blanc Gilburne Peters Williams and Johnston.

For court members who have little or no formal computing background, even a comparatively simple technical point can prove a major stumbling block to understanding, Johnston said at the May 14-15 Computer Law Institute, which was sponsored by the University of Southern California Law Center.

### Lost in Maze

Johnston cited an example from a recent case in which a hardware vendor was accused of using a "software lock-in" to unfairly restrain competition. While being shown one of the defendant's CPU boards, one of the jurors in the trial suddenly became lost in the maze of technical detail and asked where on the board the software lock-in was located.

In another high-technology legal dispute, a well-meaning but befuddled judge once asked an expert witness why he chose the Zilog, Inc. Z-80 microprocessor over Digital Research, Inc.'s CP/M operating system.

Although such instances of technical naivete may strike a computing expert as amusing, they underscore the extreme difficulty that plaintiffs often encounter when they try to prove original ownership of proprietary software or other disputed trade secrets.

Why is the authorship of a unique and confidential program so hard for its rightful developer or inventor to establish in court? Part of the answer lies in the ease with which an artful competitor can disguise a purloined software package to make it appear as if it were developed independently of its true owner, Johnston explained.

Software developers who go to court in an effort to prove trade-secret misappropriation would be well advised to avoid getting involved in long, highly technical discussions of the similarities and differences between a plaintiff's and a defendant's programs. Such discussions usually do more to confuse than to enlighten the lay public and run the risk of obscuring a legal battle's true issues in a fog of stupefying technical detail, Johnston said.

Probably the surest way of proving ownership of a proprietary software package is to present direct evidence of trade-secret misappropriation. A good example of such evidence is proof that a program's source code was photocopied or not returned to its rightful place, he said.

The next best way of proving trade-secrets theft is to build a case around circumstantial evidence. If a defendant developed a comparable software package in signficantly less time than a plaintiff or if the two companies programs contain the same errors or arbitrary information, chances are good both packages originated in the same place, Johnston said.

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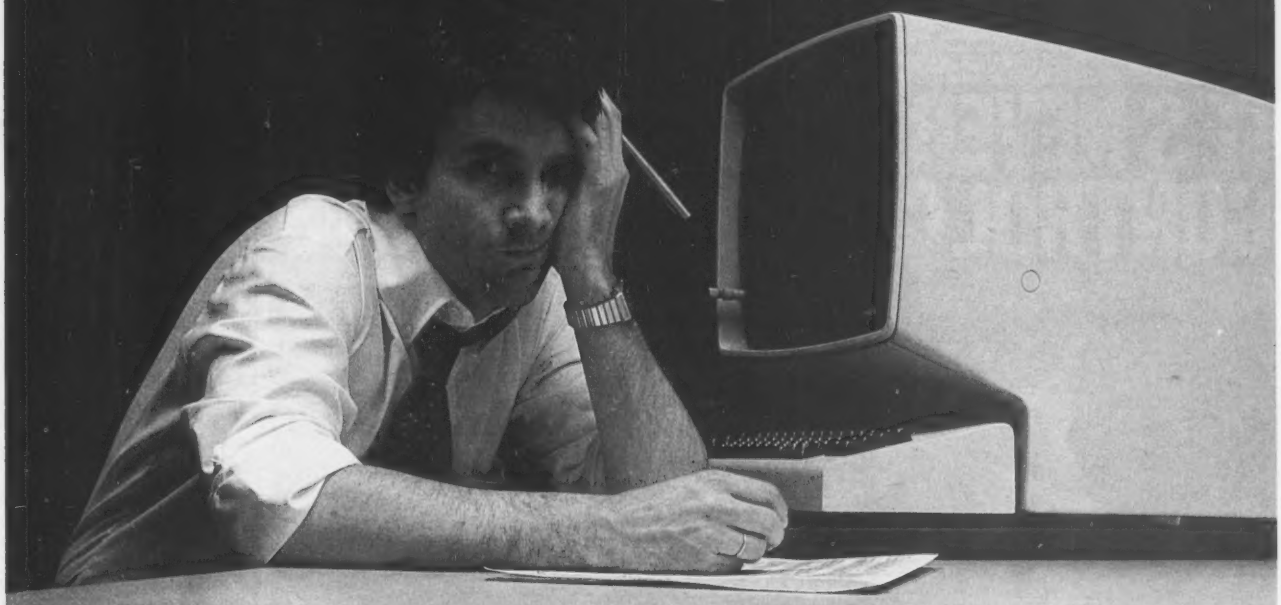
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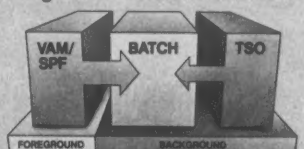
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## APL Tools Back Prime Users

PONTIAC, Mich. — Mips Software Development, Inc. has introduced an APL interface to Prime Computer, Inc.'s Midas Files system and two APL interpreters for Prime systems.

Midas is a data management software system that runs on all of Prime's virtual memory computers. The Midas Files are a type of keyed-index direct-access file that allows up to 128 interactive users to create and maintain files as large as the system's total logical disk capacity.

The two interpreters, called APL/Large Workspace (LW) and APL/Large Workspace Shared Files (LWSF), are said to provide functionality similar to IBM.

The APL Midas Interface makes it possible to create an APL cluster to store a number of separate APL items at the same time and enables users to store both functions and numeric and character variables within the same object, according to Mips.

Marketed by Mips in conjunction with Prime dealers and distributors, APL/LW sells for $8,900, APL/LWSF for $11,500, and the Midas Interface for $2,500 from Suite 202, 1899 Orchard Lake Road, Pontiac, Mich. 48053.

## 'Medusa,' a CAD Package, Runs on 32-Bit Prime CPUs

NATICK, Mass. — Prime Computer, Inc. has introduced Medusa, a computer-aided design (CAD) software package for two- and three-dimensional design, drafting and documentation.

Designed for Prime's general-purpose 32-bit computer systems, Medusa reportedly enables the company to customize its own design system. The Pime/Medusa combination also provides advanced networking and communicatins facilities for distributed processing and a centralized data base management system, the vendor said.

The Prime/Medusa system combination is packaged with its own integrated workstation, which is available with color or black-and-white terminals. The workstations reportedly provide access to control elements as well as a high 1000-line resolution display.

**Interface Capability**

Medusa was developed to run on Prime 50-Series computers and is said to be compatible with all Prime 50-Series software. Through Primos, Prime's operating system, users can access networking and data communications facilities, the vendor said, enabling them to interface Medusa's report and documentation features to other nondesign functions.

The Prime CAD package can be used for mechanical and civil engineering drawings, mechanical and electrical schematics, process flow diagrams, and three-dimensional geometric modeling of solids.

The workstation features a 19-in. display, a joystick for manipulation and control of cursors, a data tablet, PT25 character-mode terminal and a graphics controller.

An entry-level Prime/Medusa system would cost $235,000 in the U.S., including one Prime 250 CPU, 768M bytes of main memory, one 96M-byte disk drive and two workstations with black-and-white terminals.

Licensed software would include three-dimensional Medusa, Primos, Fortran, Midas and Command Procedure Language. The Medusa software can be licensed separately at $30,000 and $60,000.

Prime is located at Prime Park, Natick, Mass. 01760.

## NCSS Offers '80 Census Data

WILTON, Conn. — National CSS, Inc. (NCSS) announced that the demographic information developed from 1980 census data is available on the company's remote computer services network.

Marketbase '80 features such census counts as total population and races.

Marketbase '80 is priced at an initial sign-up fee of $250 with additional computer use charges from National CSS, 187 Danbury Road, Wilton, Conn. 06897.


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## *Tomark Enhances 'Abend-Aid'*

SOUTHFIELD, Mich. — Compuware Corp. announced Release 3.2 of the Abend-Aid package by Tomark, Inc.

The new release reportedly features an install facility for MVS users, improved support for PL/I programs, an Extended Set Task Abend Exit routine for MVS, new logic and documentation and a new recovery system, the vendor said.

Release 3.2 determines the abending program name and compile date, displacement of the abending instruction, load module name, link date and the data set name of the load library.

The displacement of the last call or I/O issued also is shown, and a special call trace summary is printed showing the calling load module name, program name and return displacement, according to a Compuware spokesman.

### Global Table

Abend-Aid is said to contain enhanced diagnostic support for University Computing Co.'s UCC-1 (TMS) and UCC-2 (DUO) abend and most user abends. It is table driven and Release 3.2 contains a Global table that allows users to set output line counts, message route codes, link list data set names, elapsed time dump force, checkpoint dump force and a "help" feature switch.

Job and Program select tables reportedly have been improved to allow dump suppression based on portions of Job name or program name.

A permanent license for Abend-Aid is available for MVT, VS2 and VS1 operating systems for $6,800 and for MVS operating systems for $8,900 per CPU. In addition, the IMS Abend-Aid option is available for non-MVT operating systems at a cost of $1,700.

Multiple CPU and multiple site discounts are available, the vendor said from 29433 Southfield Road, Southfield, Mich. 48076.

# DMS/OS Revised for IBM 'RACF'

SACRAMENTO, Calif. — Software Module Marketing, Inc. has made available DMS/OS Release 4.0 that includes support for IBM's Resource Access Control Facility (RACF), Vsam support, a message manual and other enhancements.

When a RACF data set is to be processed, RACF routines will be invoked to ensure that the user is authorized to process it, the firm noted. If authorized, DMS/OS will process the data set and maintain its associated RACF profile information.

Automatic Vsam support for archival and incremental backup is now provided with the DMS/OS, and a revised Message Manual has been developed for all messages generated by DMS/OS. Other enhancements in Release 4.0 include specification expansion for data set names and the ability to use relative GDG names.

The RACF support costs $2,500 and the other enhancements are of no additional charge to the basic DMS/OS base price of $12,000. The firm can be reached at Crocker Bank Building/Penthouse, 1007 Seventh Ave., Sacramento, Calif. 95814.

# Full-Function DYL-IDMS Out

GRANADA HILLS, Calif. — DYL-IDMS, Dylakor Software Systems Inc.'s interface to Cullinane Database Systems, Inc. IDMS data base management system, is now available in full-function load, update and retrieval.

The interface previously was available in retrieval only. It is supported by Dyl-280, Dylakor's free-form English language report writer, as well as DYL-260, the company's fixed-form report writer. The vendor claimed DYL-IDMS speeds processing from the IDMS data base.

DYL-IDMS reportedly follows the verb usage predominant in IDMS, Cobol and PL/I. It was designed for use on IBM 360, 370, 30 series, 4300 and compatible hardware.

The product can be leased for $995/year on a three-year lease, Dylakor said from 17418 Chatsworth St., Granada Hills, Calif. 91344.


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# 'Muscl' Cuts Cycle Time With Logic Decision Tables

ROCKY RIVER, Ohio — Integrated Business Systems, Inc. has developed Mini Universal Systems Computer Language (Muscl), a software program that reportedly decreases order cycle time and improves productivity.

Muscl can put complex logic in the form of decision tables to aid in structuring complex product lines, order entry systems, inventory control, computer-aided design and manufacturing (CAD/CAM), documentation of systems and accounting, according to Integrated Business Systems.

Muscl has been implemented on several minicomputer and mainframe systems such as IBM's 370, IBM 3031 and Hewlett-Packard Co. 3000 in conjunction with other computer languages such as Cobol and Fortran.

The software package costs $9,900 from Integrated Business Systems at Suite 127, 20575 Center Ridge Road, Rocky River, Ohio 44116.

# Three Accounting Packages Designed for System/38 Users

PLYMOUTH, Mich. — Louis A. Wright & Associates, Inc. is offering three accounting packages for the IBM System/38 that include general ledger/financial reporting, payroll and labor reporting and accounts payable.

The general ledger/financial reporting system features automatic entry of fixed or recurring transactions, automatically processed new company start-ups and format files that permit a range of financial statement options.

The payroll and labor reporting system features multicompany and multistate support and reporting for monthly, quarterly and yearly earnings.

The accounts payable system features automatic entry of fixed recurring expense, monthly purchase, disbursement distribution journals, year-to-date purchases and payments by vendors.

Individual packages cost between $4,000 and $6,000 from Louis A. Wright & Associates, Suite 102, Heritage Place, 496 W. Ann Arbor Trail, Plymouth, Mich. 48107.

# Financial and Modeling Package For System/34 Enhanced

FARMINGTON HILLS, Mich. — Accountech Systems, Inc. enhanced its financial planning and modeling software package for IBM System/34.

The Small Business Financial Planning and Modeling System (Finplan) reportedly now includes the ability to consolidate and pyramid multiple models and forecast financial information based on nonfinancial data.

Other features allow financial projections based on a group of data, selected suppression of financial data printing, and a quarterly/annual projected income statement, according to the vendor.

Finplan's reports include projections for balance sheet, income statement, cash flow, ratio analysis and graphics.

The enhanced Finplan package is available for a one-time fee of $1,350, which includes a 30-day guarantee, RPG source and load programs, and a user manual.

The vendor is located at 28104 Orchard Lake Road, Farmington Hills, Mich. 48018.

# IBM Users Get Marketing Package

CONCORD, Calif. — Two packages designed for marketing managers using the IBM System/34 and System/38 computers have been announced by Johnston, Brown & Associates, Inc.

The Sales Analysis and Control System (Sacs) will monitor product performance, target sales and marketing activity and identify unprofitable product lines for managers of hard goods companies, the company said.

The Finished Goods Planning System (FGP) evaluates trade-offs between service levels and inventory carrying cost and is an interactive system designed for nonprogrammers, the vendor claimed.

Sacs is priced at $24,000, including seven-day full-time support, and FGP is priced at $30,000, with five-day support from Johnston, Brown & Associates, Inc., 1465 Enea Circle, Concord, Calif. 94520.

# Data Bases Gain Search Module

LITTLETON, Mass. — Inforonics, Inc. has announced an on-line search module developed for private data bases that reportedly can store, search and edit text files.

DB-Search, available as part of the firm's Text Processing Service (TPS), reportedly provides access to large or small data bases and retrieves subsets of information. Queries may be combined for rapid searching of on-line catalogs, indexes and bibliographies.

The package features Boolean logic with "wild card" options to allow maximum access to text records, as well as key word search, creation of subfiles for further processing, access privileges for control of editorial changes and data display options.

For small user files of 125,000 records, on-line access costs $20/hr plus Telenet charges, and storage costs are 3.5 cents per 1,000 characters. Discounts are available for larger users from the vendor at 550 Newtown Road, Littleton, Mass. 01460.

## Data Briefs

### Direct's CRT Terminal Features Bidirectional Scroll

SUNNYVALE, Calif. — A CRT terminal that includes bidirectional scrolling, three scroll rates and eight video intensity levels is being offered by Direct, Inc.

The VP828 reportedly allows users to select page or line transmission, block or character transmission and the start and end of blocks. The terminal features 80 or 132 columns. The unit costs $2,490 from Direct at 1279 Lawrence Station Road, Sunnyvale, Calif. 94086.

### Volker-Craig CRT Terminal Runs With VC404, ADM-3A

ROCHESTER, N.Y. — A CRT terminal featuring switch-selectable compatibility with the Volker-Craig, Inc. VC404 and Lear-Siegler, Inc. ADM-3A is available from Volker-Craig.

Other features include a 12-in. black-and-white screen display with antiglare filter and a detached typewriter-style keyboard, numeric keypad with a double-size enter key, cursor control keys and 10 program function keys, the firm said.

The terminal costs $645 from 333 Metro Park, Rochester, N.Y. 14623.

### Interactive CRT Terminal Has 12-In. Nonglare Screen

IRVINE, Calif. — An interactive CRT terminal with a 12-in. nonglare screen and detached keyboard is out from Micro Five Corp.

The V-2000 features reverse video, flashing, underline, half-intensity, 12 control keys, a separate numeric keypad, printer interface, two pages of memory and 20 programmable functions.

It costs $1,500 from Micro Five at 17791 Sky Park Circle, Irvine, Calif. 92714.

### Interface Offers Synchronous, Asynchronous Operation

FORT LAUDERDALE, Fla. — A programmable serial communications interface capable of either synchronous or asynchronous printer-computer operations is available from Southern Systems, Inc.

The SI-9076 reportedly enables Southern System printers to function with the IBM 2780 and 3780, Burroughs Corp. Poll and Select, Sperry Univac 1004 and Honeywell, Inc. VIP 7700.

The printer systems are priced between $3,000 and $31,000 from 2841 Cyprus Creek Road, Fort Lauderdale, Fla. 33309.

# 'Green Machine' Reaps Profits, Cuts Costs, Dayton Bank Finds

Special to CW

DAYTON, Ohio — An automated teller machine (ATM) network called "Green Machine" is reportedly helping a bank here boost income, cut advertising costs and enhance market positions.

Dayton's second largest bank, The Third National Bank and Trust Co., developed the Green Machine and uses the network to expand banking locations in a five-county metropolitan area without adding new branch offices. Other Green Machine participants, based in various Ohio cities, are The Peoples Savings and Loan Association, The First National Bank, State Fidelity Federal Savings and Loan Association, Greenville National Bank, The Miami Citizens National Bank and Trust Co. and The Bellbrook Community Bank.

Third National now spends less on promotion and advertising because Green Machine subscribers share such expenses. And the network is seen as preparing Third National for expanded electronic funds transfer (EFT) activities.

#### Cutting Costs

The other six Ohio financial institutions joined the network to eliminate ATM development costs. "With our turnkey service, new institutions can have on-line ATMs up and running within 90 to 120 days," said Third National executive vice-president Douglas L. Hawthorne.

Green Machine presently includes 41 through-the-wall, stand-alone and in-lobby ATMs. These are NCR Corp. self-service financial terminals, programmed by the vendor to accept cards issued by any of the network's subscribers to customers as a means of accessing the computer-linked machines.

Third National has 22 through-the-wall Model 770 and Model 1780 NCR ATMs, as well as two stand-alone NCR 1770 self-service financial terminals, accessible in bank lobbies or retail environments.

*(Continued on Page 56)*

# Micom Unveils Line of Processors

CHICAGO — Micom Systems, Inc. has unveiled a line of communications processors, a matrix switch for synchronous terminals and an enhanced version of its Micro600 Port Selector, the Series 2.

The Micro30 Orangebox line of communications processors was designed strictly for data communications applications using asynchronous and synchronous communications protocols. By means of user-developed software, it can be used to implement terminal and communication controllers and concentrators and front-end devices.

The product features two to 18 communications interfaces, and integral modems are available for 2,400-, 4,800- and 9,600 bit/sec. The price for the Orangebox and six RS-232C I/O interfaces is $1,500.

The enhanced version of the Series 2 Micro600 includes built-in diagnostics and automatic outdial. The Micro650 Port Selector complements the Micro600 by providing similar capability for synchronous terminals. Matrix switching can be performed from individual user terminals or a central command console.

Prices for the Micro600 start at $6,000 for tabletop models and $10,000 for floor-standing models, the vendor said from 9551 Irondale Ave., Chatsworth, Calif. 91311.

## *Network Users Form Group*

SEATTLE — The Network Users Association (NUA) has been formed to represent the interests of companies and organizations that are users of networks, but are not primarily engaged in the sale of network equipment, computers or services.

The primary purpose of the association will be to promote national and international networking standards, NUA said. Educational institutions have been excluded on the belief that adherence to standards would be at cross-purposes to their role in research.

A general meeting has been scheduled here on July 21 and 22, and more information on the association or the meeting is available from Sheldon Blauman, Boeing Computer Services Co., P.O. Box 24346, Seattle, Wash. 98124.


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# Centigram Voice Digitizer Claims 'Toll Quality'

SUNNYVALE, Calif. — To advance integrated data/voice communications, Centigram Corp. has introduced what it claims is the first voice digitizer to produce "toll-quality" speech at 4,800 bit/sec.

Called Vopac (short for 'voice packet'), the product will have a major impact on automated office technology, Centigram claimed.

In real time, Vopac converts an analog, full-duplex voice input into a 4,800 bit/sec digital stream for transmission over a network. At the receiving end, another Vopac converts the stream back into analog voice, Centigram explained, while preserving toll-quality speech — speech in which the received voice sounds real rather than synthetic.

DP users can run a Vopac on a 4,800 bit/sec channel of a 9,600 bit/sec leased line, freeing another 4,800 bit/sec channel for transmission of computer data or facsimile information. A conditioned 9,600 bit/sec line also could support two Vopacs for conversations in which toll-quality voice runs both ways simultaneously, the vendor said.

### Bridging Gap

By digitizing voice with Vopac, Centigram is bridging the gap between computing and communications technology and allowing more efficient line utilization, the spokesman said. Vopac will reportedly allow data and voice to run through the same equipment.

Another benefit claimed is Vopac's capacity for speech compression. At 4,800 bit/sec, Vopac-carried voice is compressed far more than possible with conventional hardware.

The technology of compressing speech could be vital in the battle over integrated office technology, the spokesman claimed. More compression gives users more performance out of transmission lines at the same cost.

Vopac costs $15,000. Deliveries will begin in September, Centigram said from Suite 108, 155A Moffett Park Drive, Sunnyvale, Calif. 94086.

# ATM Net Proves Bank Aid

(Continued from Page 55)

"Convenience stores are finding that ATMs, especially ones that can be used by the customers of many institutions, are powerful tools for boosting traffic," C. Michael Barger, Third National operations director, pointed out. "And shoppers enjoy the option of banking in a warm, well-lighted store 24 hours a day, seven days a week. We don't know what the market saturation point will be, since we haven't approached it yet," he added.

While some ATMs routinely handle more than 14,000 transactions per month, average monthly volume on the Green Machine network has reached 7,500 transactions per machine. On the average, each Green Machine ATM transaction costs network members 40 cents, including ATM depreciation.

Now holding assets that reportedly exceed $550 million, Third National installed its first eight off-line ATM units in 1972. Two years later, the bank upgraded to on-line operation; an IBM 370/135 mainframe in its data center was driving 13 ATMs by 1977.

### Costs Climbing

By that point, however, "we were averaging a horrible 340 transactions between breakdowns," Hawthorne recalled.

As monthly usage surpassed 5,000 transactions per machine, "labor and costs were out of hand and climbing for everything."

Also, examiners from the federal comptroller of the currency "found security flaws faster than we could correct them," he added. Third National sought advice from NCR on how to improve its facilities. "When we replaced our original ATMs with NCR 770 units," Hawthorne stated, "we immediately increased the number of transactions between failures by a factor of four."

Edward J. Cord, assistant operations officer, said, "It often took branch tellers up to three hours to balance the ATMs we used with our previous systems.

"Now branch personnel can handle ATM close-out chores, primarily removing cash envelopes, in about 10 minutes."


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# *Fiber-Optic Link Among Options Unveiled for Harris 9220*

DALLAS — A fiber-optic host channel link, multiple-host communications and a matrix printer are options now available to users of Harris Corp.'s Data Communications Division's 9220 information processing system.

The fiber-optic link reportedly extends the maximum direct channel attachment between an IBM host and 3270-type displays and printers from 1.5 kilometers to 3.5 kilometers.

The multihost communications capabilities can support communications with two hosts concurrently. The 9220 can communicate with one local and one remote or with two remote hosts. Remote communication protocols supported include IBM's Bisynchronous and System Network Architecture Synchronous Data Link Control, the firm said.

A matrix printer designed for medium-speed print operations and capable of speeds of 80-, 130- and 180 char./sec is also being offered with the 9220. The 9287 printer can be field-upgraded as additional print operations warrant, the vendor said.

The fiber-optic link costs $200/mo over a two-year lease with maintenance, and shipments are scheduled to begin in September.

The multihost communications capability costs $743/mo for two SNA-compatible remote communication devices. For one remote and one local device, both SNA-compatible, the cost is $945/mo.

The 9287 printer costs $154/mo on a two-year lease with maintenance.

Harris can be reached at 16001 Dallas Parkway, P.O. Box 400010, Dallas, Texas 75240.

# AJ Electronic Mail Unit, IBM-3270 Emulator Debut

SAN JOSE, Calif. — Anderson-Jacobson, Inc. (AJ) is offering an electronic mail workstation and dial-up access to IBM 3270 applications.

The AJ 412 electronic mail workstation reportedly turns any Ascii terminal into a multifunction message center capable of sending and receiving messages between workstations. It can be used for refiling messages between dissimilar networks and terminals in central message rooms.

Existing terminal applications such as interactive time-sharing, forms creation, plotting and off-line letter composition may be performed concurrently with message handling through foreground processing and background communicating, the vendor said.

The workstation will cost between $2,000 and $3,000 and the product will be available in September.

The AJ Series 771 Terminal Control Unit (TCU) is indistinguishable from an IBM 3270 control unit to the host processor and can emulate the full screen capabilities of the IBM 3277 and 3278 display stations, its vendor said. It may be accessed on a dial-up basis or by directly connected terminals. The AJ 771 eight-port configuration costs $10,750, Anderson-Jacobson said from 521 Charcot Ave., San Jose, Calif. 95131.

# Codex Intelligent Terminals Boast Multitasking Operating Systems

MANSFIELD, Mass. — Codex Corp. has introduced two intelligent terminals featuring multitasking operating systems, multiple terminal support, a variety of peripherals, communications and application development tools.

The CDX-68 series was designed for applications requiring high-performance data communications, decentralized data entry, validation, inquiry and word processing capabilities, the vendor said.

The CDX-68/24 and CDX-68/44 systems reportedly support several communications protocols, including 3270, 2780/3780 and teletypewriter. The 68/24 has 2M bytes of diskette storage, upgradable to 4M bytes. The 68/44 has a 10M-byte disk subsystem and is expandable to 40M bytes.

Both terminals utilize an OS-9 operating system patterned after the Unix operating system. With OS-9, multiple users reportedly can execute a variety of programs concurrently.

Typical configurations supporting Cobol applications and batch communications will be priced from $16,500 for a two-terminal 68/24 to $24,500 for a four-terminal 68/44. Deliveries will begin the last quarter of this year, Codex said from 24 Cabot Blvd., Mansfield, Mass. 02048.

# Telex Offers RS-232 Options

TULSA, Okla.— Telex Computer Products, Inc. is offering an IBM 3767-compatible tabletop keyboard printer and an enhanced block mode version of its 310 Ascii terminal to provide users with an alternative to the RS-232 current-loop interface.

The Model 767 printer was designed for interactive and batch processing. It can transmit and receive data from IBM 370, 4300 or 8100 hosts using Systems Data Link Control line protocol at up to 4,800 bit/sec or 2740/2 line protocol at up to 1,800 bit/sec.

The product prints bidirectionally and uses a Diablo Systems, Inc. Hy Type II printer mechanism with a plastic daisy print wheel. It costs between $5,700 and $6,050.

The RS-422 interface on the block mode 310 terminal extends the distance and speed possible using an RS-232 Current Loop interface and eliminates the need for users to calculate cable resistance.

It costs $1,400, the vendor said from 6422 East 41st St., Tulsa, Okla. 74135.

# Ven-Tel Modem Has Bell Compatiblity

SANTA CLARA, Calif. — Ven-Tel, Inc. has unwrapped a modem that it said permits software configurability and integral dialing capability.

The MD103J is Bell 103J-compatible and offers originate, autoanswer and internal direct-access arrangement, Ven-Tel said. When configured with an optional integral autodialer, it is designated the 300 Plus.

The modem costs $395; an intelligent version costs $550, Ven-tel said from 2390 Walsh Ave., Santa Clara, Calif. 95051.


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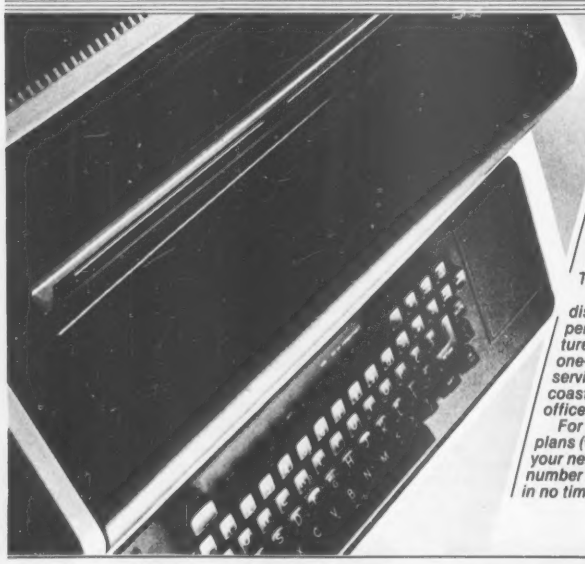
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*Many Vendors Switching Emphasis*

# User Interface Tops System Design List

By Tim Scannell
CW Staff

The most important part of any computer system is not the hardware or software, nor can it be measured in terms of kilobytes, throughput speeds or response times.

People are the primary system interface. People who sit in front of a computer terminal each day to enter or access data or, with a flip of the wrist, unscrew one disk pack from a disk drive to replace it with another.

Because people are the most important part of a computer system and their acceptance of that system is a necessary ingredient for data security and smooth system operation, many vendors are designing their systems with the user interface in mind. Vendors are, in effect, ironing out the rough edges of previously unfriendly CPUs and terminals, making them more acceptable from a human standpoint.

However, making a computer system user-friendly involves a little more than brightly colored processors and a detachable CRT keybord. Within the past year or so, a trend toward the development of nonspecialized, multifunction, integrated systems — in other words, systems that are aimed at general-purpose functions, can be used for a variety of applications and use only tested software to perform specific jobs — has been evolving among vendors.

### Three Reasons

In a paper delivered earlier this year in England at the Sixth International Computing Symposium, an event sponsored by the European chapters of the Association for Computing Machinery, William Newman of Logica VTS Ltd. offered three reasons why an integrated computer system is operationally better than a vertically aimed machine:

• Integrated systems offer a consistent and unified user interface that makes it easier to learn exactly how the system operates. Therefore, if a frequent user sits down in front of a CRT terminal screen and calls up a foreign program, a minimum of effort is required to learn the ins and outs of the unknown program.

• Because all the computer's functions are integrated across-the-board, users can generate data within one program and pass that information along to a text editing program, injecting this data into the word processing function. This aspect is particularly important if the people using the same system range from the secretarial and management level to the research and scientific areas.

• Most integrated systems offer a rapid context switching capability that allows users to switch from one function to another and back again without a great deal of difficulty.

*'Within the past year or so, a trend toward the development of nonspecialized, multifunction, integrated systems — in other words, systems that are aimed at general-purpose functions, can be used for a variety of applications and use only tested software to perform specific jobs — has been evolving among vendors.'*

Unfortunately, Newman pointed out in his paper, there are roadblocks to the development and proliferation of integrated computer systems. The biggest handicaps presently are the high cost of hardware and the complexity of the software needed to support such a system, he noted.

On the subject of software, many systems today incorporate some type of on-line assistance program or routines that are designed to help the user complete an assigned task. Typical systems of this genre

*(Continued on Page 60)*

*User-Oriented Utilities*

# Data Entry Station Reads Hand Print

WALTHAM, Mass. — Pencept, Inc. is offering a data entry turnkey workstation based on hand-print recognition so that data can reportedly be prepared for computer input as soon as it is written on a preprinted form.

The basic configuration is a stand-alone or single-workstation system consisting of a Digital Equipment Corp. LSI-11/23 microcomputer, 256K bytes of memory, a diskette subsystem with 2M-byte disk drives, a quad-port EIA RS-232 serial interface board, tablet and tablet interface electronics and a VT100 CRT terminal.

For higher performance, a 10M-byte Winchester disk drive can be added as an option. As user needs grow, the stand-alone system can be extended into multiterminal clusters, the firm said.

Pencept has included a series of user-oriented utilities for forms generation and forms/display control. The forms generation utility allows the user with little or no support required by his data processing organization to create or revise input forms for source data capture. The forms/display control utility orients the forms and display image and provides for testing the source data capture applications. Additional source data capture software extensions and utilities include: data edit and validation; forms and data formatting; inquiry/retrieval; report writing; sorting/merging and Basic language.

At the four-workstation level a typical configuration consisting of a basic control unit, 10M-byte Winchester disk, 1M-byte floppy, four CRT terminals and character recognition tablets, a 132-col, 125 char./sec printer and a comunications controller will cost $56,000 to $58,000. A similarly configured eight-station cluster with 40M bytes of disk storage will cost less than $80,000.

More informatin is available from the firm at 1393 Main St., Waltham, Mass. 02154.

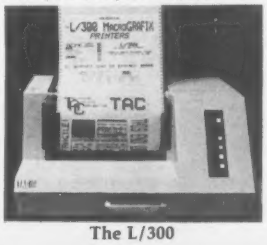
# Printer Handles Graphics, Alphanumerics Applications

ATLANTA — A 300 line/min graphics printer said to handle both standard alphanumeric output applications and graphics output requirements such as bar codes and line drawings is available from Technical Analysis Corp.

The L/300 can perform on-line creation of forms, labels, signs, banners, manuals and rough draft correspondence and has multicopy capability, the vendor said.

It is available in several versions suitable for direct interface to the IBM System/34, System/38 or 3270 series controllers as well as any other system that provides printer data via standard asynchronous RS-232C serial Ascii connection, the company claimed.

The L/300 graphics printer is priced at about $8,500 with 30-day delivery from Technical Analysis Corp., 120 W. Wieuca Road, Atlanta, Ga. 30042.




The L/300

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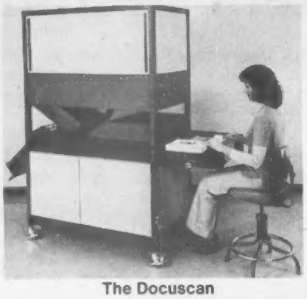
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# Unit Digitizes Documents For 200 Dot/In. Resolution

WOODLAND HILLS, Calif. — Terminal Data Corp. has introduced Docuscan, a high-speed, high-resolution document digitizer that scans and converts documents to a digital signal at a 200 dot/in. format.

By combining a high-resolution digital video camera and a vacuum hold-down paper transport, documents are scanned on both sides in .5 sec per side.

Under microprocessor control, the system converts up to 3,000 page/hour to a digital data screen through the use of digital scanning and a high-speed paper transport that includes an automatic page turner. Applications include facsimile and input to advanced document storage and retrieval systems.



The Docuscan

The Docuscan costs $85,000 from Terminal Data, 21221 Oxnard St., Woodland Hills, Calif. 91367.

# *POS Terminal Calls Out Prices*

DALLAS — National Semiconductor Corp. has introduced a "talking" point-of-sale (POS) scanning system containing a speech synthesis chip that will call out prices of items as they are scanned or entered manually.

The device provides high-quality reproduction of human voice and will reinforce the accuracy of pricing at the check stand, according to the firm.

When purchased as one system, the starting price for a one-lane POS system with the Positalker is $7,300. National Semiconductor is at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

# Harris Offers Copy Processor

MELBOURNE, Fla. — A copy processing system series designed for medium-circulation newspapers and commercial typesetting companies has been announced by Harris Corp.

The System 90 series features a low-profile design and supports the latest company software, which provides editing, wire handling, classified and display advertising and typesetting capabilities, the vendor said.

The System 96 features dual CPUs and disks and has 64 I/O ports for peripheral support, while the System 95 is a single-CPU system with 320 KW MOS memory and provides 32 I/O ports with an optional data base disk for duplicate recording, the company claimed.

The System 95 with 12 terminals is priced at $150,000 and the System 96 with 24 terminals at $250,000 from Harris Corp., 505 Rodes Blvd., Melbourne, Fla. 32901.

# Systems Grow User Friendly

*(Continued from Page 59)*

include Sperry Univac's Conversational Time Sharing (CTS) system, the University of Wisconsin's Help program and the University of California at Berkeley's Genie program.

Ideally, user assistance programs should be multilevel, situation-dependent, easy to use and easy to program and maintain, Nathan Relles, a senior researcher for Univac in Blue Bell, Pa., said at last month's National Computer Conference. These types of systems are particularly in demand because computers are being used directly by the problem solvers rather than through DP professionals.

From an operational standpoint, on-line assistance systems incorporate an assistance data base that helps point the user in the right direction for desired information. The assistance data base may include concepts or text fragments that are linked to the central data base's data or information that is similar to the data contained in the computer system's reference manual, Relles pointed out.

Unfortunately, most of today's hand-holding systems are cumbersome and "demonstrate an insensitivity to user needs," he said.

For instance, one type of system presently available requires that the user be aware of a long list of rules before the system will point out the right road, Relles explained.


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# OCR-A Printer Interfaces With Terminal, Processor

DAYTON, Ohio — NCR Corp. has announced an optical-character-recognition (OCR-A) printer that can interface with an intelligent terminal or mainframe processor.

Called the NCR 6448, the table-top microprocessor-based unit can produce tags or labels with up to four lines of OCR-A font characters at 32 char./line. An optional six-line version produces four lines of the OCR-A font and two lines of standard uppercase alphanumeric characters and special symbols, the vendor said.

Tags and labels meet the standards of such organizations as the National Retail Merchants Association and the Voluntary Retail Identification Standard Specification A, 1974 for OCR-A Size 1, according to NCR.

The printer may be attached to a variety of intelligent terminals and mainframes that communicate asynchronously through a standard EIA RS-232C or CCITT V-24 interface. Both the four-line and six-line models support either point-to-point or pollable asynchronous protocols at transmission rates from 110- to 9,600 bit/sec, the vendor said.

The four-line model costs from $7,700 and the six-line model costs from $8,200. The units lease for $322 and $355 a month, respectively, the vendor said from Dayton, Ohio 45479.

# Bits & Pieces

## Image Processor Handles Engineering Applications

CAMBRIDGE, Mass. — The Microtex Corp. has developed a microprocessor-based image processing development system for use in engineering and scientific applications.

In a small, portable keyboard terminal, the Microtex 7400 System contains all the hardware and software necessary to acquire eight bits of grey-scale image data at one MHz from up to two Riticon line scan or matrix cameras. As a stand-alone tool or a prototype test bed, the Microtex 7400 allows the user to get on-line in new image processing applications immediately, the firm said.

The basic system costs $28,995 and includes training, system integration, applications support and a 90-day warranty from Microtex at 80 Trowbridge St., Cambridge, Mass. 02138.

## Top-of-Line Epson Printer Introduced to U.S. Market

TORRANCE, Calif. — The 136-col. MX-100, the top of Epson America, Inc.'s. MX Series of dot matrix printers, is now being introduced to the U.S. market.

The MX-100 uses dot matrices ranging from 9 by 9 to 18 by 18 to generate correspondence-quality printing in a total of 12 different character weights and sizes. The printer also features Epson's Micro-nine disposable print head and Graftrax, a high-resolution bit image graphics capability.

The MX-100 costs $995 from Epson at 28344 Hawthorne Blvd., Torrance, Calif. 90505.

## Minolta Device Controls Microfilm Data Retrieval

RAMSEY, N.J. — An automatic retrieval device said to control the search and retrieval of microfilm data on the firm's reader/printers has been announced by Minolta Corp.

The Mars Controller 1 is designed to interface with both the company's RP 405E and RP 407E reader/printers, and accomplishes retrieval by counting image marks generated by a variety of 16mm recorders, the company said.

The controller features 8-digit display and a user-oriented keyboard as well as self-programming for A and B channel limits and dual-level searching, the company said.

The Mars Controller 1 is priced at $3,500 from Minolta Corp., 101 Williams Drive, Ramsey, N.J. 07446.

## Power System Assures Continuous Operation

LORAIN, Ohio — A series of uninterruptible 1-, 3-, 5-, 7.5- and 10 KVA power systems said to assure continuous operation of essential equipment during blackouts, brownouts, interrupts and line transients has been announced by Lorain Products.

When ac power is available, the Constac unit functions as a battery charger and line filter, with automatic transfer occurring in the event of ac line disruption, the vendor said.

With delivery of some models from inventory, the Constac uninterruptible power systems are priced from $2,769 to $11,038 from Lorain Products, 1122 F St., Lorain, Ohio 44052.


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# Displaywriter Gets Record, Communications Support

FRANKLIN LAKES, N.J. — For the second time since its introduction less than a year ago, the Displaywriter text processing system has been enhanced by IBM's Office Products Division. This time the division added software to give the system a records processing capability and provide communications support.

The records processing capability is provided by two programs: Textpack 4 and Reportpack. The programs enable users to define, create and revise information files. These electronic files can be used as a data base or can be merged with text and mathematical input to produce correspondence, satistical summaries and customer-designed management reports, IBM said.

When creating a report, a user can select both the sequence of information and the type of material to be included in the final output. Records can be added to a file, selected for review or printing, deleted, revised, counted, renumbered or duplicated into another file.

When used to produce letters, the programs provide automatic merging of variable information into a file with standard text material. At the same time, mathematical information to be included in a letter can be calculated and checked, IBM said.

**Textpack Capabilities**

Textpack 4 used in conjunction with Reportpack provides the ability to create the basic format to be merged with various files, according to IBM.

An electronics module with a 256K-byte memory capacity is available to accommodate the two packages. Both the electronics module and the two packages will be available in February, IBM said.

The computer programming support allows communications between the Displaywriter and a variety of IBM operating systems and programs resident in host IBM computers. The support — which consists of binary synchronous and asynchronous communications programs — reportedly gives users access to data in central IBM systems, allowing that data to be merged with text contained in the Displaywriter's memory.

**Step Forward**

These recent additions are described by IBM as a step toward the Displaywriter's eventual support of communications, including the firm's Systems Network Architecture.

Finally, another program, called Magnetic Card Conversion, reportedly gives the system the capability of using a magnetic card unit to read and record magnetic cards from a number of IBM products.

The monthly license fee for Textpack 4 is $28. The monthly fee for Reportpack is $15. The packages will be available in February 1982, and the communications support will be available this September.

A basic Displaywriter system, consisting of a display with a keyboard and logic unit, printer and a diskette recorder/reader costs $7,895, or $275/mo including licensed programs, IBM said.

A basic system that records processing capabilities, including a dual diskette recorder/reader and larger memory capacity, costs $10,245, or $354/mo, according to IBM.

Quantity purchase discounts are also available on the text processing system, the spokesman said.



**A Great Basin Aerial Surveys specialist picks pass points in a set of two photos called a 'stereopair.'**

# Mini Surveys Deserts, Swamps, Cities by Photo

Special to CW

SPARKS, Nev. — The minicomputer at Great Basin Aerial Surveys has seen arid deserts, steaming subtropical swamps and the concrete and steel of heavily populated cities. All without the benefit of expensive airline tickets or extensive travel.

Great Basin is an engineering photogrammetry firm located here that uses the minicomputer in conjunction with airborne cameras and stereoscopic instrumentation to survey and map various parts of the country. The computer and other instruments are also used for volume studies, digitization and consulting for a wide variety of industrial and government clients.

The data processing system currently consists of a Hewlett-Packard Co. HP 1000 F series processor with 512K bytes of memory, a 20M-byte disk, a paper tape reader and printer and an HP 2748B graphics terminal.

Basically, Great Basin obtains its geographic information by recording, measuring and interpreting photographic images. The firm is using this technique at the moment to determine 300 miles of boundary coordinates at Death Valley National Monument for the National Park Service.

**Minimal Damage**

"The method is not only extremely cost-effective, but it also reduces to a minimum the environmental damage that can sometimes be done by bringing large survey crews into an area," Larry Grube, head of data processing at Great Basin, said. "We do much of the necessary work from helicopters and airplanes at altitudes of 1,500 to 3,000 feet."

The survey process begins on the ground when a two-man crew locates boundary monuments based on the park's original survey notes. These early monuments are generally marked stone, while later ones are brass caps about three to four inches in diameter.

Once located, these monuments are placed on a panel painted with a white cross that

*(Continued on Page 68)*

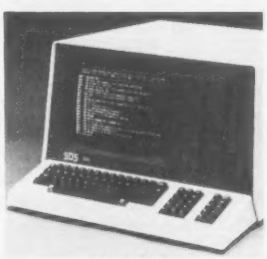
*Five-Component Unit*

# Business System Features WP

VENICE, Calif. — Scientific Data Systems, Inc. has announced the SDS 420, a small business system that offers word processing (WP) and intelligent terminal applications.

The unit is comprised of five basic components: a 12-in. diagonal CRT terminal that displays 25 lines of 80 char. each, a printed circuit board containing the microprocessor and peripheral controllers for the CRT terminal, keyboard, floppy disk drive and external printer, according to the Scientific Data Systems spokesman.

A second printed circuit board contains 32K bytes of memory; a power supply; a nesting detachable keyboard that includes a numeric pad, cursor controls and three programmable keys; and a dual-floppy diskette drive capable of storing 1.2M bytes of data, the vendor said.



**SDS 420**

Scientific Data Systems has also announced a word processing package, a financial system, a legal time/billing system and a medical system.

The Model 420 with 32K bytes of memory and 1.25M bytes of dual diskette drive storage costs $8,400, Scientific Data Systems said.

The word processing package costs $1,000; the financial package, $1,250; and the legal time/billing system and medical packages cost $1,000 each, the vendor said from 344 Main St., Venice, Calif. 90291.

# Micromation System Assigns Separate Processors, Memory

SAN FRANCISCO — Micromation, Inc. has introduced a multiuser computer system for business and office environments that, like its M/Net system unveiled last year, allocates a separate processor and memory to each user in a system network.

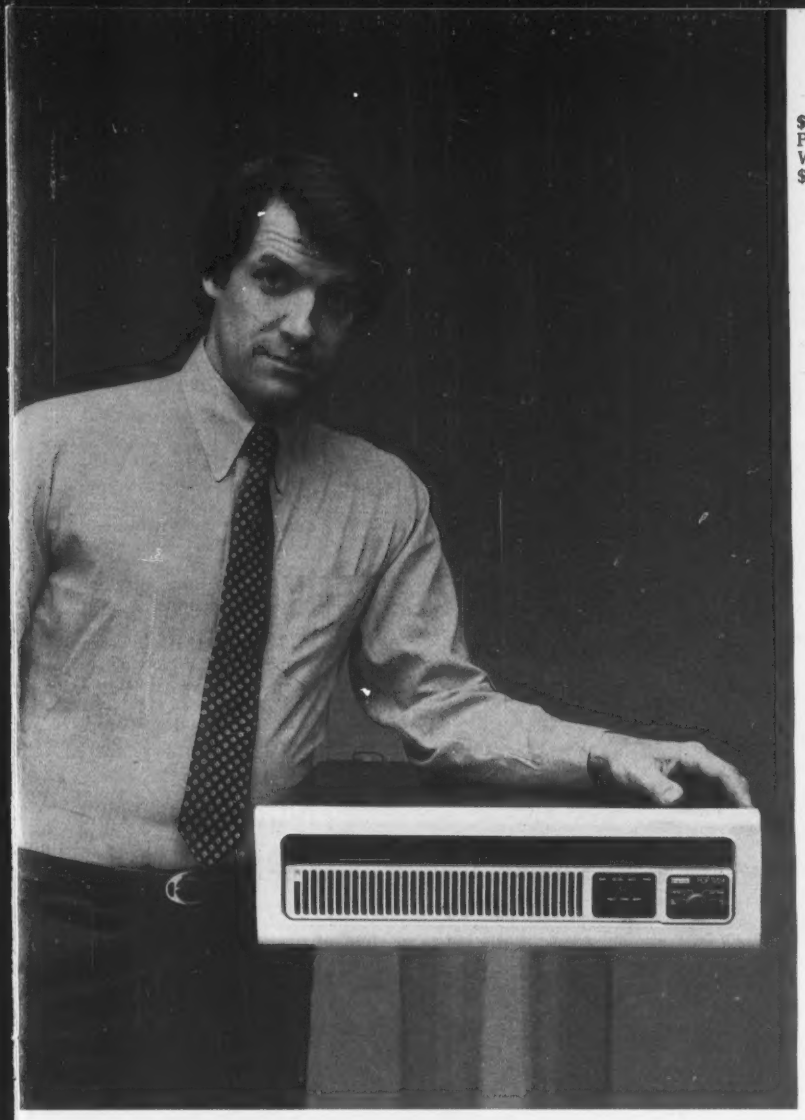
The Mariner 9000 handles up to eight users, giving each one up to 64K bytes of memory. Independent satellites are linked in the system via a system bus to mass storage devices and other peripherals. A master processor oversees system operation and arbitrates bus usage, a spokesman said.

All of the system's eight-bit components are packaged in a single cabinet about the size of a standard two-drawer file cabinet, he added.

The single cabinet can be configured with one or two single- or double-sided floppy disk drives, for a capacity of 2M bytes, and an 8-in. Fujitsu Win-

*(Continued on Page 66)*

# No minicomputer in history has ever given you more power for $11,000.



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# RBI Offers DMA Unit

SILVER SPRING, Md. — RBI Systems, Inc. has announced a direct memory access (DMA) version of the IEEE 488 interface for Data General Corp. Nova and Eclipse computers.

The Model 417-DMA is priced at $2,400 and is available with 60-day delivery time from RBI Systems, P.O. Box 6393, Silver Spring, Md. 20906.

# *Printer Inks for System/34*

OAK BROOK, Ill. — Professional Computer Resources, Inc. has announced the Daisywriter, a printing system for IBM's System/34.

The system features a Xerox Diablo daisy wheel printer that uses interchangeable plastic and metal daisy print wheels. More than 100 print styles are available. Options include 96-char. plastic wheels and 96-char. metal wheels and 88-, 92- and 96-char. metal wheels in 10-, 12-, and 15-pitch settings. All print wheels have true, proportionally spaced fonts, and the Daisywriter uses both film and fabric cartridge ribbons, the vendor said.

The unit costs approximately $5,000, the vendor said from 2101 Midwest Road, Oak Brook, Ill. 60521.

# Datamac Portable Enters Small Business Market

SANTA CLARA, Calif. — Datamac Computer Systems has entered the small business systems market with its 1200 series microcomputers, featuring the Datamac 1255 portable computer.

The Datamac 1255 includes a Z-80 processor, 64K bytes of random-access memory, I/O ports, keyboard, CRT and two 5¼-in. double-sided, double-density minifloppies.

The industry standard CP/M operating system is offered along with software including Basic, Fortran, Cobol, Pascal, Forth, macro-assemblers, business packages, text editors, word processors and utilities.

**External Drives**

External floppy drives of any configuration can be added and an alternate control and display screen is also included in the system.

The 1200 series will range in price from $2,995 to $4,995, depending on floppy configuration, the vendor said.

The Model 1255 with two double-sided, double-density minifloppies containing 780K bytes of storage costs $4,695 from the firm at 333-F Octavius Drive, Santa Clara, Calif. 95051.

# Mariner Debuts

*(Continued from Page 63)*

chester hard disk drive with a 21M-byte capacity. Backup for the hard disk is provided by a ¼-in. magnetic streaming tape cartridge.

In addition to storage peripherals, the Mariner system is said to support virtually all RS-232 CRT terminals and a variety of printers, including those with serial and Centronics Data Computer Corp.-type interfaces.

The system can be field upgraded by inserting additional component inteface boards and satellite processor cards into the unit's card cage.

The card cage is attached to the computer's hinged front panel.

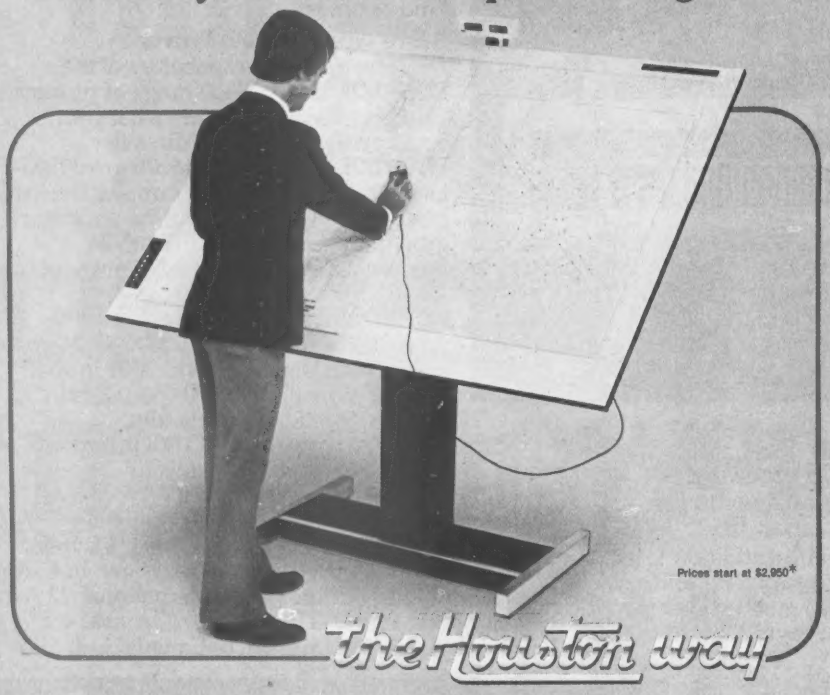
The system operates with standard power sources and carries a base price of $4,500 for a single-user system, Micromation said.

A complete eight-user system with a 21M-byte hard disk and two single-sided floppy drives has a base price of $23,700, the spokesman noted.

Micromation is located at 1620 Montgomery St., San Francisco, Calif. 94111.

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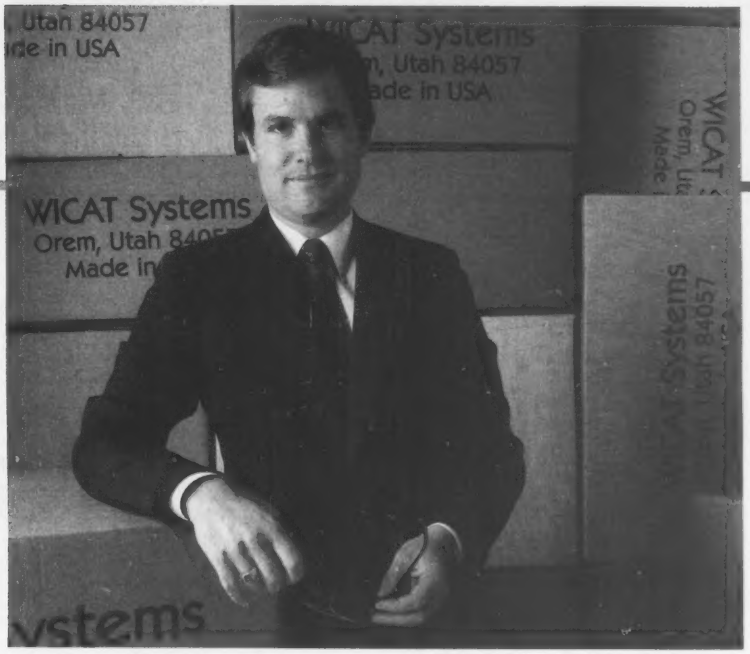
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## *Able Offers DEC-Type Minis For Gap Between DEC, MIL-Spec*

IRVINE, Calif. — Able Computer, Inc. has announced the 34 Magnum and 44 Magnum, two plug-compatible processors aimed at replacing Digital Equipment Corp.'s PDP-11/34 and PDP-11/44 systems.

The Magnum 34, which is a replacement for the DEC PDP-11/34, comes with 256K bytes of memory. The larger Magnum 44 is compatible with DEC's PDP-11/44 and comes with 512K bytes of memory, the vendor said. The two Magnum models are designed to fill the gap between DEC models and those intended for MIL-Spec operation.

Standard configurations consist of a processor with floating point and memory management, serial console management, extended memory addressing to 4M bytes, dual TU5B cartridge tape units including interface, programmable line time clock, bootstrap loader, 8K bytes of cache memory and maintenance console, the vendor said.

Able Unibus-compatible controllers are optional.

Both Magnum systems are supported by RSTS/E, RSX-11M and RT-11 operating systems, and both use DEC-embedded CPUs in a rack-mountable chassis, according to the vendor.

The Magnum 34 costs $21,000 and the Magnum 44 costs $27,000, the vendor said from 1751 Langley Ave., Irvine, Calif. 92714.

## Mini Surveys Deserts, Swamps, Cities by Stereoscopic Photos

*(Continued from Page 63)*

can be seen from the air. These panels are placed about every 1,800 feet along a particular boundary line.

Next, aerial photographs are taken of the areas that have been covered. After the film has been processed, a specialist goes through all the transparencies and locates the marked panels. Using a mirror stereoscope, the specialist then picks "pass" points until a pair of photographs overlapping the same area are matched up.

Each set of two photos is called a stereopair. This process is continued for an entire strip of photos, which can include up to 20 transparencies, Grube explained.

Next, the specialist determines the photographic coordinates of each image point with respect to the camera axis or photo center using an instrument called a comparator.

The comparator measures distances or ranges from four known points on the comparator frame. Range data is then recorded on paper tape and input into the computer, Grube pointed out.

### Program Series

A series of three programs is then used to determine the x-y photo coordinates of each photo image.

Great Basin developed about 40 Fortran programs to handle all aspects of the analytical work required to turn x-y photo coordinates into specific ground coordinates.

The computer first takes the photo coordinates from the paper tape and eliminates errors such as film shrinkage, atmospheric refraction distortions and other irregularities.

Then it takes the refined photo coordinates and, using already determined coordinates of the control panels, simultaneously intersects them — a process that takes less than a minute for each photo in a photo block, Grube said.

Using the coordinates of the previously unknown panels, a crew goes back to the park and sets new monuments along the park boundary. The calculations for setting these monuments are made by the computer and printed out, so that the survey crew does not have to make the calculations by hand, the DP head noted.

"Even though we do have to send a heavily loaded crew in for the final survey, the crew knows exactly where it is going, since all the coordinates have been determined by the computer," he said.

Previously, Great Basin used a time-sharing computer service to do all the analytical processing and determine the ground coordinates from the photo coordinates, Grube added. However, this service was not only becoming more and more costly, but it was also extremely slow.

Currently, the firm's stereo plotter talks directly to the system's drafting table, although Grube plans eventually to have the HP 1000 talk to the drafting table via an RS-232 interface. This way, the drafting table will appear to the computer as a terminal, and data will be transferred in the form of an Ascii string.


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# High-Tech Firms' Executive Salaries Tied to Return On Investment

SAN FRANCISCO — The salary scale for executives at high-technology firms can be correlated with the return on investment for the capital employed by those firms, according to a recent compensation practices survey by Peat, Marwick, Mitchell & Co.

Although the study did not publish salary scales for executives at various levels in the industry, results showed that 67% of the companies that paid their executives the highest salaries had a return on investment higher than the median for the 22 Northern California companies included in the survey.

Within the group interviewed, the average return on equity was 23.1% and 6.9% return on sales. For Fortune 500 companies as a whole, return on equity is about 14% to 15% and return on sales is about 4.5%, a spokesman for Peat Marwick explained.

(Continued on Page 74)

# *DOD Charged With Obstructing Export Efforts*

**By Robert Batt**
CW West Coast Bureau

PALO ALTO, Calif. — Charges that the Department of Defense (DOD) is obstructing high-technology companies in their efforts to increase exports were leveled here recently.

Speaking at the first of a series of seminars on "The High Technology Export Challenge" that will be held in five cities this year, Jack Klingert, vice-president of overseas operations for Control Data Corp., accused DOD of going against the spirit of the 1979 Export Administration Act.

"De facto foreign policy is being made by less than five people located somewhere in the bowels of the Department of Defense. We believe these people are not administering the law as it was intended," Klingert told Lawrence J. Brady, assistant secretary for Trade Administration at the Department of Commerce, who also attended the seminar. Instead, Klingert

(Continued on Page 78)

# TI Setbacks Force Layoff Of 2,800 People

DALLAS — Plagued by continued financial setbacks, Texas Instruments Corp. late last month laid off 2,800 people — 3% of its total work force.

In a related move, the firm decided to phase out several product areas because the financial returns on these products were inadequate and the prospect of a turnaround was dim.

Prompting the layoffs were continued weakness in the semiconductor and consumer product areas and, to a lesser degree, reduced demand for its distributed processing systems, the firm said.

Since January, TI has had about 10% of its 90,000 worldwide work force on reduced work schedules [CW Dec. 29/Jan.5]. By making the layoffs, TI will be able to put those workers back on full-time schedules in the near future.

"TI is anticipating full work schedules in U.S. operations barring any further weakening of demand," the firm noted in a prepared statement.

There is little prospect for a favorable near-term outlook for certain TI products, the firm noted at its annual meeting on April 16. The firm cited excess capacity since the fourth quarter of last year for its MOS chips as a major contributor to poor financial performance. However, a spokesman also noted that many users of its distributed 990 systems and smaller OEMs were feeling the continued pinch of high interest rates. Also contributing to the downturn is the recession in Europe.

(Continued on Page 75)

# Bell Restructuring Under Way, Brown Tells Industry Execs

**By Marcia Blumenthal**
CW Staff

HYANNIS, Mass. — The Bell System is in the process of managing its transition from a regulated monopoly to an intensely-competitive but still regulated company, according to AT&T Chairman Charles L. Brown.

And the monolith's way of "coping" with the changing telecommunications industry environment is working, Brown told more than 200 investment analysts and industry executives gathered here recently for the Electronic Industries Association's sixth annual telecommunications conference.

AT&T has been taking the initiative in restructuring itself according to the markets and users it serves, Brown said. This could be interpreted as an initial move by AT&T to break itself into subsidiaries, which, he said, the firm is willing to do.

AT&T must change its pricing to reflect the cost of doing business and revamp its price structure so that it is no longer skewed to telephone service, Brown said.

AT&T has no parallel in the history of U.S. industry, but "we must rewrite history in real-time," he stressed. And the information industry today stands on the threshold of unexcelled opportunities, Brown said, singling out the attractiveness to users of real-time interactive services. The public will ultimately gain from the new order that will be set in place by information processing technologies.

Legislators and regulators are devel-

(Continued on Page 76)

# *Micromation Moving to Bolster Position in DDP Market*

**By Robert Batt**
CW West Coast Bureau

SAN FRANCISCO — With the Japanese currently making a big effort to bolster their expertise in the area of microcomputers, small business systems have taken on added significance as manufacturers attempt to gain a bigger slice of the fast-growing distributed data processing (DDP) market.

One U.S. company that is attempting to lead the way in the scramble to produce suitable products for tomorrow's integrated office environment is Micromation, Inc., a San Francisco-based manufacturer of multiprocessor systems.

Known best for its M/NET system, claimed to be the first to implement multiprocessing with a discrete CPU and 64K-byte random-access memory for each user. Micromation used the recent National Computer Conference in Chicago to launch the Mariner, a product designed specifically for the office and business environment (see story on Page 63).

Based on the M/NET architecture, the Mariner series is a modular multiuser system that uses 8-bit technology in an unusually efficient manner, Micromation

(Continued on Page 72)

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W105

# User Files Suit Against DEC, Local OEM Over PDP-11/03-Centered System

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A disgruntled user has sued Digital Equipment Corp. and one of its local OEMs for allegedly breaching a contract to deliver a fully operational business system built around a DEC PDP-11/03.

The user, Albert Holloway of neighboring San Mateo County, has accused the minicomputer vendor and its OEM, The Systems Co., of "falsely representing" the PDP-11/03 as new and failing to complete the system's installation within the specified time limit of 30 days.

Holloway also accused the two defendants of:

- Reneging on an agreement to service and maintain the system.
- Engaging in "fraud and deceit" by selling the system for nearly five times its true value.
- Refusing to return almost $11,000 worth of allegedly unearned customer payments.

Holloway's suit — which seeks more than $130,000 in punitive compensatory and other damages — was filed in superior court here Dec. 26, 1978. Since then, both DEC and The Systems Co. have filed affidavits denying Holloway's accusations.

### Origins of Dispute

The dispute began shortly after March 29, 1978, when the two defendants contracted with Holloway to supply a 32K-byte PDP-11/03 system incorporating dual floppy disk units and a display terminal. Holloway intended to install the system in his home and to use it in running his own business, a company known as ALH Laboratories, Inc.

Under the written contract, Holloway agreed to pay DEC and the now-defunct Systems Co. exactly $9,434. In return, the two defendants were obligated to install a "new, fully operative" PDP-11/03 system, Holloway said in his five-count complaint.

Part of the system was supposed to be delivered immediately; the rest, no more than 30 days later. The contract also required DEC to perform all the system's service and maintenance, the complaint alleged.

But shortly after the contract was signed, DEC reportedly notified the plaintiff by telephone that it would be unable to service or maintain the system. To make matters worse, the configuration Holloway eventually received was not new, nor was it made fully operational within the required 30-day limit, he said.

Holloway considered the defendants' actions a breach of contract and on April 13, 1978, mailed a letter informing the two companies that he had rejected their system and was rescinding the existing purchase agreement. The letter also demanded restitution for the $9,434 Holloway had already paid his suppliers and for an additional $1,332 he had spent on an extra memory module.

### No Return

None of the plaintiff's $10,766 in systems payments has ever been returned. Holloway reportedly needs the money to buy a replacement for his PDP-11/03, and unless his request for restitution is honored, both he and his company will suffer "grave and substantial harm," the complaint claimed.

Holloway's suit also accuses DEC and The Systems Co. of charging inflated prices for a system whose true worth was only $2,000.

As punishment for alleged "oppression and malice," Holloway seeks $100,000 in punitive damages. The suit also asks for $20,000 in compensatory damages as well as $10,766 to cover all the plaintiff's allegedly unreimbursed payments.

## Directory to List System/34 Software

SILVER SPRING, Md. — A directory of vendors of software products for the IBM System/34 is being compiled here by the Computer Science Division of Professionals Unlimited.

Vendors that would like to be included should send their company name, a contact name, address and telephone number as soon as possible to Professionals Unlimited, 3951 Lantern Drive, Silver Spring, Md. 20902.

## *Informatics Opens Center For Demos*

BEDFORD, N.H. — Informatics, Inc. opened its first software center here to demonstrate its financial software products to potential users.

The product demonstrations are designed for accountants, controllers and chief financial officers and enable them to work directly with the on-line interactive software products, according to Dick Carlsen, director of marketing for Informatics' Application Products Division.

The demonstrations include general ledger/financial reporting and accounts payable/purchase orders.

Informatics has set up computer terminals in each of its locations. Prospective users will be contacted through direct mailings. Those interested in demonstrations of specific products can arrange these by appointment.

### Includes Slide Presentation

There is a brief introductory slide presentation for each software product and then the potential user can sit at the terminal and go through exercises, Carlsen said.

"Software in the past has been almost intangible," he added. "This way they can come in and really get to experience the feel of the system and learn its functions and capabilities."

Other software centers are planned for River Edge, N.J. Raleigh, N.C., Chicago, and Canoga Park, Calif. Informatics Applications Products Division is located at Bedford Farms, Bedford, N.H. 03102.

## Expansions

**Accudata, Inc.** has moved to corporate offices in Suite 240, 2814 New Spring Road, Atlanta, Ga.

**Sperry Univac Plaza,** a twin-tower office complex near Chicago's O'Hare Airport that consolidates 10 of the company's major operating units, was recently dedicated.

**Bell Telephone Laboratories** plans to build a major technology development facility in Freehold Township, N.J.

**American Management Systems, Inc.** has moved its corporate headquarters to 1777 N. Kent St., Rosslyn, Va. 22209.

**Periphonics Corp.** has opened new headquarters at 4000 Veterans Memorial Highway, Bohemia, N.Y.

**Megatek Corp.** will lease an additional 59,400 sq ft of factory space in a building adjacent to its current headquarters facility in San Diego, Calif.

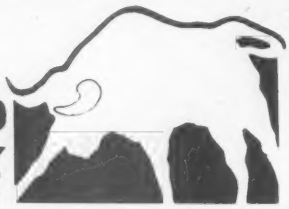
**Phoenix Data, Inc.** of 3384 W. Osborn Road, Phoenix, has expanded its design, manufacturing and operational facilities to cover 16,000 sq ft.


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# Micromation Moving to Boost DDP Mart Stand

(Continued from Page 69)

tion said. Instead of funneling all system functions through a single processor, the company claimed each user (up to eight), is allocated a separate satellite processor card — Z80A and 64K bytes of memory.

The independent satellites were designed to link up in the new system via an S-100 bus to the mass storage devices and other peripherals. A master processor oversees system operation and arbitrates bus usage.

According to the company, the advantage of such an architecture is that it enables expensive peripherals to be shared by all users while giving each operator access to a complete computer. At the same time the system uses familiar 8-bit technology for service ease and software availability.

### Claim to Fame

Micromation's claim to fame is that its multiprocessor system, using CP/M software, enables multiple users sharing a common data base to get the same performance as if they had their own system.

Ben Cooper, Micromation's president, told *Computerworld*, "Machines such as ours with multiprocessing and mainframe-type power are going to get a large piece of the action.

"We are looking at an immense market and as machines with more sophisticated design move up the performance curve, the market will become increasingly driven by software."

Currently, Micromation uses the S-100 bus architecture as its medium of communication within its multiple user, multiprocessing network system.

But as the technology improves, the company said it intends to manufacture stand-alone equipment capable of communicating with other systems using either the standard RS-422 synchronous communication link or high-speed modems.

### Software Development

The company, which four years after its foundation is showing sales of $6 million, is putting a lot of effort into software development.

"One thing we realized early on was that the real cost of software is hidden.

"As sale prices go down, reliability needs to go up and we believe the support of software and hardware is going to be increasingly important.

"In our opinion the next revolution will be in software support and we plan to provide the tools to successfully implement software," Cooper said.

Although most of the company's early sales were from first-time users, recent orders suggest that M/NET and its derivatives are now being taken more seriously by sophisticated end users.

### M/NET Customers

Recent customers include:

• Systems Development Corp., a San Diego-based company that uses M/NET in a programming development application for the Navy. The system is used for off-line editing and compiling of Fortran programs.

• Brown and Root, a division of Dresser Industries, Inc. that specializes in construction for the oil industry. It has installed M/NET systems at a nuclear power plant in Texas. The system is used for tracking inventory of construction equipment, engineering analysis and scientific applications.

• ABC Television, which is about to install an eight-user M/NET system for use in tracking and monitoring usage of its video tapes.

As the company increases its market share, it is beginning to win prestigious contracts against tough competitors such as IBM, Data General Corp., Digital Equipment Corp. and Prime Computer, Inc..

Michael O'Rourke, vice-president of marketing and sales, said, "The power of the microcomputer is allowing us to penetrate areas of the DEC and Data General world, in particular, that we couldn't penetrate before."

### Confidence Showing

With sales up 25% in 1980 and expected to double this year, the company is confidently predicting after-tax profits of 10% of turnover in 1981.

That confidence is apparently shared by the market, with Micromation successfully raising $1 million in venture capital recently. Sixty percent of the company's sales are overseas, half of them in Europe.

Cooper sees prosperous times ahead. He said, "Everyone wants to get into the multiuser environment because that's where the market is."




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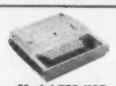
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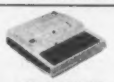

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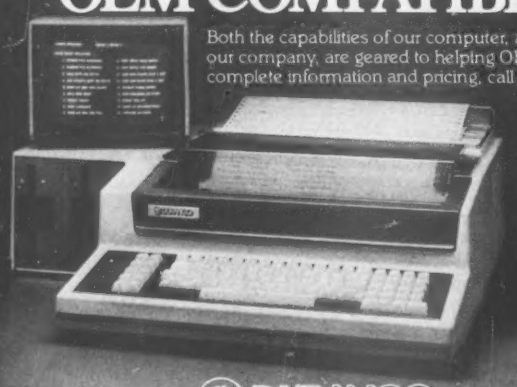
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# Now Eyeing Graphics, Ramtek Searches for Cash As Loral Deal Collapses

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — Ramtek Corp., a pioneer in the field of color graphics, is looking around for new sources of cash following the collapse of a proposed takeover deal with Loral Corp., a specialist in electronic warfare communications systems.

The $60 million deal was called off after New York-based Loral decided to reduce its original offer by $10 million. Ramtek's response was to throw the offer out the window, and now the Santa Clara company is searching for new ways to raise the money it needs to finance its growth.

It is in the area of business graphics that the firm now wants to place much of its effort. "Business graphics is going to be the real carrot in the market. It is going to be a massive market. We need to pick a niche and develop a product where no one else is really doing a good job or servicing the area, such as graphics arts or presentation graphics," Charles E. McEwan, Ramtek president, said.

He added that while the company's strategy is to avoid a head-on clash with giants such as IBM and Hewlett-Packard Co., even possessing a small niche of a fast-growing market could accrue hundreds of millions of dollars.

### Healthy Performance

Because the company has grown at an annual compound growth rate of 55% over the last few years, there has been a continual dilution of its funds, which the Loral deal was designed to stop, he said. Nevertheless, the company has turned in a healthy financial performance to date, despite a 39.5% drop in profits in the third quarter.

Profits at $1.2 million in the first nine months have already exceeded the 1979/80 level, and Ramtek said the third-quarter profit drop was caused by a $650 thousand write-off of inventories.

Ramtek is generally regarded as the No. 1 company in the area of raster-scan color graphics displays, which convert computer-generated data into visual images on a video display, printer/plotter or large screen projector. Founded in 1971, it became a publicly held corporation in December 1978. Its business is split largely among general-purpose graphics, applications in government, applications the medical field (for use with computer tomography scanners) and process control.

Recent studies show the computer graphics industry, including hardware, software and services, is projected to grow from an estimated $2 billion in 1979 to around $5 billion by 1984. Ramtek expects its own growth to be even faster, with raster scan — which accounted for 25% of a $212 million market in 1979 — climbing to 65% of a market worth almost $700 million over the next four years.

"Graphics enables you to get at the information quickly and speed is the essential aid to fast decision making, hence the growth in business graphics," McEwan said. "After all, the only thing the MIS manager is interested in is how easy the system is to use and what kind of information it gives."

That graphics can be used in widespread applications is now no longer in doubt, he pointed out. Some of the applications claimed by Ramtek for its equipment include financial and market planning; process control in oil refineries, paper mills and power plants; military uses such as command and control applications; and even chip design, where the customer supplies his own software.

The absence of user-friendly software has long been considered by many users to be a drawback in the widespread use of graphics [CW, Feb. 23]. McEwan freely admitted that Ramtek has had problems in this area. "Our software has not been user-friendly enough. If we are going into the end-user turnkey business we will have to solve this problem," he said. Ramtek spends 15% of its revenues each year on research and development, 35% of which is devoted to work on software.

## Contracts

**Boeing Computer Services Co. has signed a five-year agreement with Bunker Ramo Corp.'s Information Systems Division to provide host computer processing services to banks throughout the country to install Bunker Ramo's Bank Control System 90 on-line teller terminal systems.**

Rolm Corp. and Miltope Corp. have signed contracts for Micropolis Corp.'s 8-in. Winchester rigid disk drives and drive assemblies for integration into their respective product lines.

**California Computer Systems, Inc. has signed an OEM distribution agreement for two Systems Plus, Inc. software packages, Accounting Plus and FMS-80.**

RCA American Communications, Corp. have announced an agreement in principle whereby MCI will lease a minimum of 1,000 voice-grade circuits on the RCA American Satcom satellite communications system for a three-year period.

**Innovative Data Technology, Inc. has been awarded an annual contract by Analog Devices, Inc. to supply digital magnetic tape storage systems for use on the Macsym 2 minicomputer-based measurement and control system.**

Lortec Power Systems, Inc. has won a $1 million-plus contract to provide 16 Uninterruptible Power Systems and support service for Satellite Business Systems earth stations.

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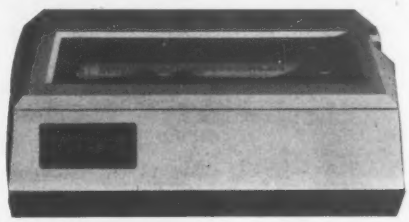
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# Exec Salaries Tied to Return on Investment

(Continued from Page 69)

However, salary compensation is only one aspect of recruiting and retaining executives. Most high-technology firms have attracted high-level managers by offering stock options. Ninety-five percent of the companies included in the survey have relied on stock option plans to attract executives.

Firms surveyed were largely computer-related firms and included Hewlett-Packard Co., Intel Corp., National Semiconductor Corp., Amdahl Corp., Tandem Computers, Inc. and Verbatim Corp.

However, as of May 21 the tax benefits derived from qualified stock-option plans ended because of the Tax Reform Act.

Now executives with stock options will have to lay out substantial amounts of money to exercise those options, the survey indicated. Moreover, insider trading restrictions prevent those exercising stock options from selling the stock for six months.

Therefore, the financing of the capital to use the option as well as the revised tax burdens will no doubt tend to make stock option plans unattractive.

In contrast to general industry trends, high-technology firms have relied heavily on stock option programs to motivate and reward executives for long-term financial results, the survey noted.

But these stock-option plans have become less advantageous as a company grows beyond the embryonic development stage.

### 'Market Development'

Because many high-technology firms are beyond that stage and are now in what is generally termed the "market development" phase, these firms will have more competitive executive compensation programs if they offer other programs.

Two of these plans now being employed regularly outside the high-technology industry are stock appreciation rights and performance shares. Of the 22 firms surveyed only five offered plans other than the now-nonqualified or the now-obsolete qualified stock option plans.

Under a share performance program, executives receive a stipulated amount of shares of the company's stock if the return on investment or other performance measures attain prearranged goals, the survey noted.

With this type of stock program, executives do not have to lay out any of their own money in order to receive corporate stock.

## Mergers/ Acquisitions

**Telesoftware, Inc.** and **Renaissance Systems, Inc.** have announced their merger into a new company called Telesoft.

**SCS/Compute,** the Midwestern and Western Divisions of Comshare Tax Services, Inc., has been repurchased by **Robert W. Nolan** and **James W. Andrews.** Noland and Andrews are the founders of Systematic Computer Systems, Inc., the predecessor of SCS/Compute and Comshare Tax Services, Inc.

**Hewlett-Packard Co.** has entered into negotiations with **Information Resources, Inc.** to acquire the software development firm in its entirety through an exchange of stock.

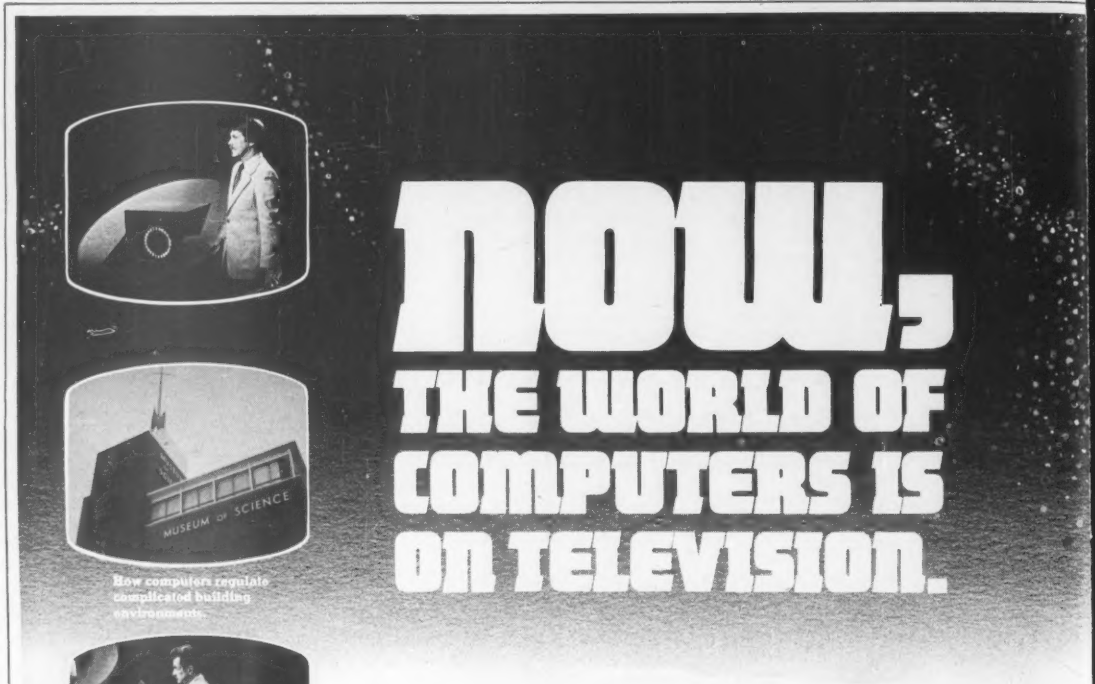
**KDM Information Systems, Inc.** has acquired the outside software operations division of **Data Consultants, Inc.**





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There's much more to "Computerworld" for television, but we can't go into it all. We invite you to find out for yourself. Join the experts and interested laymen who are enjoying and benefiting from this unique new television experience. Right now, we cover 13 major tv "ADI's" (Areas of Dominant Influence), which include about half the computer people in the U.S., and we have plans for expansion in the fall.

# Executive Corner

• John M. Scandalios has been named vice-president of marketing at Tri-Data, Inc.

• Bob G. Wright has been named vice-president of Vector General, Inc. and general manager of CPS, a subsidiary of Vector General.

• Fran Moynihan has been appointed vice-president of U.S. sales for the Systems Division of Pertec Computer Corp.

• Ted Wisniewski has been named vice-president of manufacturing for the Computer Division of General Automation, Inc.

• Dr. Thomas Crooks has been named vice-president of marketing for Xmark Corp.

• Albert Behar has been elected vice-president of system development at STSC, Inc.

• Robert R. Burns has joined Control Data Corp. as a vice-president of Control Data Business Advisors, Inc.

• Francis H. Stelter Jr. has been named division vice-president of marketing at RCA Government Systems Division.

• Donald P. Moffet has been named general manager of Zenith's Computer Business Group and president of Zenith Data Systems Corp., a subsidiary of Zenith Radio Corp.

# TI Forced to Lay Off 2,800, Phase Out Product Lines

*(Continued from Page 69)*

While TI experienced a growth in orders for its distributed systems in the first quarter compared with the order rate in the comparable quarter the year before, current order rates have weakened appreciably, the spokesman said.

Besides the layoffs, TI phased out its magnetic bubble memory, plasma panel display, liquid crystal and selected lines of low-margin discrete semiconductor products.

Moreover, the company is also eliminating its supply company distribution operation and appliance electronics and is beginning to slow its digital watch operations.

### Bubble Phaseout

Commenting on its decision to phase out the much-talked-about bubble memory development, the TI spokesman noted other technologies have come down the cost/learning curve faster than bubbles.

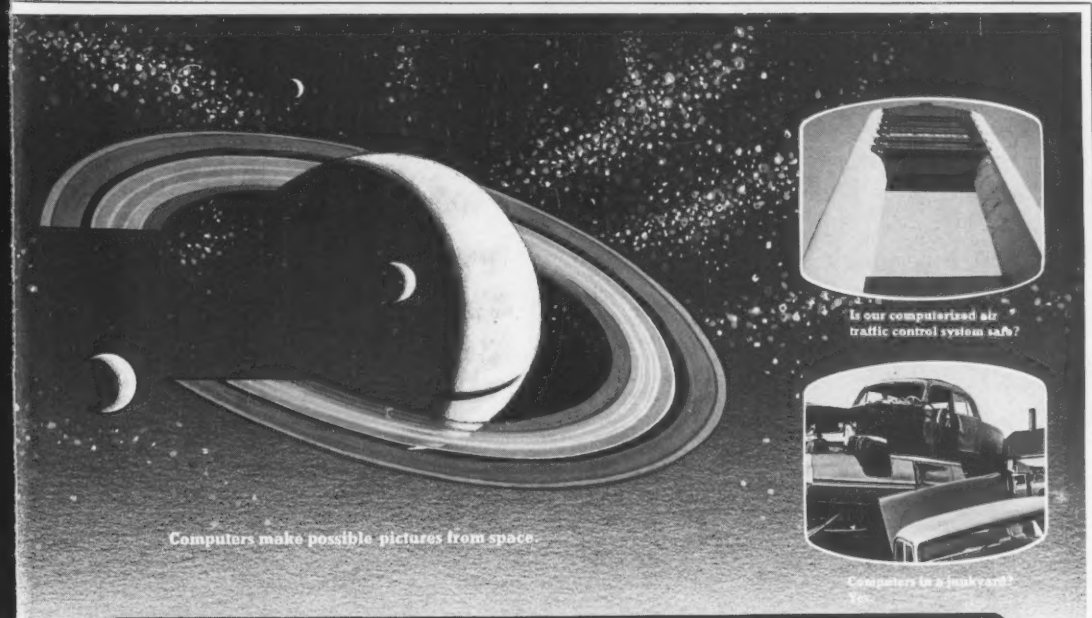
Moreover, the company decided to halt the plasma display effort after an evaluation of the expenses required to bring that technology into full-scale production.

However, all present and upcoming customer commitments will be honored and those users will be serviced and fully supported, the spokesman said.

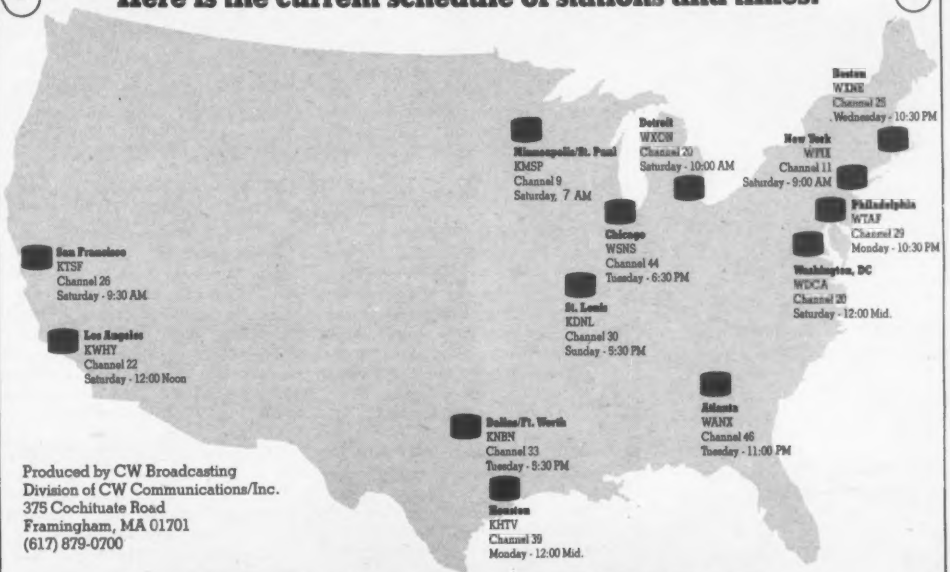
These phaseout costs and severance payments will be a further depressant in 1981 earnings, the firm noted.

TI started to express concern in last year's third quarter for its financial performance during the first half of this year.

Last year, the firm's revenues were $4.1 billion compared to 1979 revenues of $3.22 billion. Earnings for 1980 were $212 million compared to the $173 million earned in the prior year.


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# *Intel Entering OEM Market*

AUSTIN, Texas — Intel Corp. announced that its Commercial Software Systems Operations is entering the OEM software market by allowing its System 2000/80 data base management customers to sublicense that software directly to their own customer bases.

Under the new arrangement, the company's customers can market their System 2000/80 applications as fully integrated products rather than as two separate entities and pay Intel a royalty fee each time they install the product. More information on the arrangement is available from Intel Corp., 12675 Research Blvd., Austin, Texas 78766.

# Supershorts

Comsat World Systems Division plans to construct a $50 million satellite communications earth station in central Pennsylvania to handle the growing volume of international communications traffic in and out of the eastern U.S.

— — —

The National Association of Computer Stores has announced the appointment of Susan D. Cardosi as executive director of the nonprofit trade association for computer retailers and suppliers.

— — —

Scientific-Atlanta, Inc. has formed Digisat S.A. to serve the Mexican market for communications equipment. Digisat will be owned 51% by Mexican investors and 49% by Scientific-Atlanta.

— — —

Continental Telephone Corp. of Atlanta and Thomson-CSF, an affiliate of the Thomson-Brandt group of France, have agreed to form a joint venture to design, manufacture and market business communications equipment and systems in the U.S. Executone, Inc., a New York-based Continental subsidiary, will become part of the newly formed corporation.

— — —

National Semiconductor Corp. and Motorola, Inc. have signed an alternate source agreement to develop, manufacture and market 256K-bit and 1M-bit magnetic bubble memory devices and LSI bubble memory controllers.

— — —

Applicon, Inc. is continuing negotiations with General Electric Co. regarding the disposition of the Applicon common stock held by GE's subsidiary, Business Development Services, Inc. The parties have discussed a registered underwritten secondary offering at GE's expense as well as private placements to permit GE to comply with its agreement with the Federal Trade Commission's staff to dispose of GE's Applicon stock.

— — —

Toyomenka (America), Inc. has announced the formation of OCR Systems, a division that will market state-of-the-art optical character recognition systems to end users and OEM manufacturers in the U.S.

— — —

American Microsystems, Inc. and Voest-Alpine AG, an Austrian corporation, have announced an agreement in principle to establish a joint venture company in Austria. The new company would design, produce and market MOS very large-scale integration circuits in Europe.

— — —

Alanthus Data Communications Corp. and Ohio Scientific, Inc. have jointly announced that Alanthus will commence third-party maintenance on Ohio Scientific's line of business computers as of July 1.

— — —

Computer Associates, Inc. has established its own marketing subsidiary in France in a move to bring sales and services directly to its users there.

— — —

Compuserve, Inc. announced that more than 10,000 customers now comprise the active list of subscribers to its Compuserve Information Service.

— — —

Memorex Corp. has received the White House E Star Award for Export Expansion for its "outstanding and aggressive creative marketing."

— — —

William O. Baker, former chairman of the board of Bell Telephone Laboratories, was awarded an honorary doctor of science degree by Tufts University. During his career, Baker has made significant discoveries in the area of molecular chemistry, and under his direction major advances were made in telecommunications and information processing technology.

— — —

Comshare, Inc. is selling its individual income tax processing services operations and has adjusted its investment to estimated net realizable value resulting in a book loss in excess of $2.2 million.

— — —

ITT will become the exclusive distributor of Zilog, Inc. microcomputer systems in 15 Latin American countries.


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# Brown Tells of Bell Restructuring

*(Continued from Page 69*

loping an understanding of what it takes to match AT&T's skills, and there is a growing recognition in Washington that a nationwide communications network needs to be managed by one entity; if this system is fragmented, the nation will suffer, Brown maintained.

This remark by Brown may have been made in the context of recent remarks made by Secretary of Defense Caspar Weinberger advocating that AT&T not be broken up. However, the U.S. Justice Department in its antitrust case against AT&T has asked for divestiture of Western Electric.

"We cannot take something that is so interrelated and break it up," he continued.

Where competition is ordained it should be allowed to work, but "let it happen without the hand of the master handicapper in Washington," Brown noted.

Brown said his company could enjoy the benefits of competition at the same time as retaining the advantage of a regulated monopoly. To this end, the firm is prepared to break its business segments into subsidiaries, he reiterated.

There will no doubt continue to be contention about how this is done, Brown noted, pointing out that Computer Inquiry II allows AT&T to compete in emerging markets.

"We must exercise our instincts not in a courtroom, but in the marketplace," creating a civil and cordial relationship among entities that comprise that marketplace, he said.

Moreover, the industry — which is now characterized by litigation — must be changed to one where the interests of the customer are served, he added.

Regulators are also showing a recognition of the earnings requirements of Bell. For example, they now realize depreciation schedules applicable to the "old monopoly days" are no longer fitting, Brown concluded.

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# DOD Charged With Obstructing Export Efforts

(Continued from Page 69)

claimed, they are using weapons of delay which continually frustrate CDC.

"You have frequent examples of a low-level piece of peripheral equipment being evaluated to the status of high technology requiring an export license because it contains a single microprocessor.

"It is these little cases concerning relatively low technology that is causing the bulk of the problems," he added.

Klingert's remarks were endorsed by an RCA Corp. representative who said that many high-technology companies are also frustrated by the problems of obtaining export licenses.

Under current U.S. law, the Department of Commerce can refuse to grant an export license to a company or organization attempting to sell high-technology products to a hostile country.

Following the Russian invasion of Afghanistan, former President Carter placed a ban on high-technology exports to the Soviet Union, and CDC was a major victim of this policy.

Replying to the criticisms, Commerce's Brady called CDC a "unique case. CDC manufactures some high-technology products which this administration will simply not allow to be exported to the Soviet Union," he said.

Brady told the seminar, which was designed to help kick off World Trade Week, that while export controls would continue as a means of safeguarding national security, the level of controls is being carefully reviewed by the Reagan team.

### Export Act Criticized

He criticized the Export Administration Act passed under Carter for focusing too much attention on dealing promptly with export applications rather than determining what technology should be exported in the first place.

"At the moment, the export control system is characterized by what I call 'ad-hocism,' which is totally undermining clarity and predictability. There will be changes in the Office of Export Administration, and we are committed to cleaning the mess up.

"There will be costs to this, however, and we will not be able to please everyone within the data processing industry. It may be that part of the solution to the problem is that while people will no longer have to wait 18 months to get an answer to their application, there may be more negative answers coming out of the Department of Commerce," Brady said.

### Process Know-How

Currently there are about 80,000 applications a year in the export field, according to Brady.

Officials are making a fundamental review of the situation to determine what is needed to protect the security of the U.S. In his view, process know-how is the key element to be safeguarded.

"Earlier this year, the export control system collapsed. Interagency conflicts within the government have paralyzed the process. We are studying again our policy toward the Soviet bloc and China and the machinery by which this policy is addressed," Brady said.

Brady argued that the effectiveness of controls is largely dependent on multilateral cooperation through Cocom, the agency representing the North Atlantic Treaty Organization allies and Japan that monitors exports of high-technology goods to communist countries.

"The procedures adopted by Cocom, whereby a company notifies it of a sale after the event, is no control at all. We are ready to take on our allies in this matter," Brady said.

The assistant secretary also stressed that the new administration will adopt a different approach from the Carter one.

There will be a strong stress on contingency planning whereby export controls could be used in specific instances, according to Brady.

For example, he said it was clear the Soviets had been told of the consequences for trade in the event they invaded Poland.

But he added it was not an effective policy to slap on export controls when Soviet dissidents were put on trial, as happened under Carter, only to take them off again once they had been put in jail.

At the same time, Brady warned computer companies not to expect opportunities for unfettered trade. "There is a great realization in the intelligence agencies that the Soviet Union has been helped militarily by high-technology exports from the West over the last 10 years. The question now is how we can prevent that from happening again," he said.

The four remaining Export Challenge seminars are scheduled to be held in Chicago, Boston, Dallas and Los Angeles.


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## Nickels & Dimes

**Hewlett-Packard Co.** has declared a two-for-one split of its common stock as well as a regular quarterly cash dividend of six cents per share on the increased number of shares, which represents a 20% increase in the cash payment. The stock split is effective June 17.

$$$

**Sykes Datatronics, Inc.** authorized a pro-rata distribution of its common stock to shareholders of record on June 5 at a rate equal to two additional shares for each share held. The payment date is June 19.

$$$

**Computer and Communications Technology Corp.** has announced a two-for-one common stock split payable June 30 to stockholders of record June 5.

$$$

**Technalysis Corp.** has announced a 13-for-10 stock split payable in the form of a 30% stock dividend to be issued June 12 to shareholders of record May 29.

$$$

**Telecom Systems Group, Inc.** has completed an agreement with a private group of investors to provide the company with $2.2 million in additional capital in exchange for a minority percentage of the company's common stock.

$$$

**Adage, Inc.** is planning a public offering of approximately 500,000 shares of its common stock.

$$$

**Evans & Sutherland** has announced a 200% stock dividend in the form of a three-for-one stock split of the company's common stock. The record date for the dividend is May 26, 1981, with distribution of the new shares June 9.

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Natl'y recog software firm whose products are used by Fortune 500 co's seeks exp writer to prepare customer-oriented prod documentation. Oppty for advancement equals the fast growth. Prefer indiv with knowl of hi-level lang. Salary **$23,000**

**DATA BASE ADMIN**

Major mini vendor seeks indiv to estab DBA function in $100MM div. Will have oppty to implement the DBMS strategy. Maximum visibility for business-oriented, tech exp'd "pro." Salary **$35,000**

**MFG SYS ANALYST**

Prominent Cent Mass info products firm has newly created pos for mfg sys hvy. Req exp with all systems facets of mfg cycle. Will manage major new projs from design thru implementation in IBM 4341 shop. Salary **$30,000**

**SYSTEMS ANALYST-MAINE**

Lge fin'l services firm offers the pace of Coastal Maine & state-of-the-art IBM OS/MVS environ. Seeks sr contributors with strong COBOL, BAL & on-line exp to design & implem new apps. Salary **$24,000**

**PL-1/CICS ANALYST PROG**

Prestigious invest mgmt firm seeks indiv to assume lead role in new devel effort. IBM OS/MVS exp perf. Oppty to join select team with resp for analysis & programming. Salary **$29,000**

**OS SYSTEMS PROG**

Continued expansion of hi-tech mfg firm creates need for OS internals hvy desiring MVS environ. Req exp with BAL, COBOL, CICS & DBMS. Oppty to work on variety of new tasks. Salary **$32,000**

**SR COBOL PROG/ANALYST**

Mktg div of leading computer vendor seeks P/A with exp in sales/mktg apps. Must have COBOL & either interactive, data base or distributed exposure on any vendor's hardware. Outstanding benefits & working conditions. Salary **$25,000**

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**DATA BASE MANAGER**

Prominent, fin'l inst seeks systems mgr w/bkgrd in data base admin & proven budget & people skills. Lead a tech group in DL/1 devel. Salary **$35,000** range

**SYSTEMS 34 DEVELOPMENT**

Maj mfr desires take charge systems "pro" to handle sys 34 opns w/lge branch network. Strong tech & comm skills req. High corp visibility. Salary **$32,000** range

**PROJECT LEADER**

Consumer prod co seeks sr mfg prog/analyst to lead project in online devel. Strong COBOL & fin'l or mfg apps knowl req. Lge IBM mainframe. Salary **$27,000** range

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Outstanding Prov co seeks sr systems analyst for lge scale design. Proj ldr resp. Plan & coordinate user & DP resources in implementation. State-of-the-art environ. Salary **$25,000** range

**COBOL PROGRAMMER**

"Blue Chip" RI co seeks exp'd programmer. Online systems devel & hvy user interface for fin'l personnel & prod apps. Excellent benefits w/tuition reimbursement. Salary **$23,000** range

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**SR PROG/ANALYST**

Hi-tech mfg co loc in Southern Tier of NY State needs analyst with proj ldr capabilities. Sophisticated IBM shop req. COBOL bkgrd & CICS. Database exp a must; VSAM a+. Excellent career pos with hi-visibility. Salary **$30,000**

**SOFTWARE SPEC**

Resp incl DB/DC, systems prog & tech support for prog staff. Lge IBM/OS mainframe a must; CICS & DL-1 perfect fits. Expansion pos for people-oriented software analyst. Salary **$32,000**

**PROG/ANALYST**

Min 2 yrs COBOL exp will qualify for this expansion pos. State-of-the-art IBM 4331 instal needs prog with CICS bkgrd. Multi-plant mfg co has proven track record in internal promotion. Outstanding peer group. Salary **$23,000**

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**PROG/ANALYST**

Western NY fin'l institution needs programmer with CIF & banking sys exp. Must have COBOL bkgrd. Resp for vendor evaluation, testing, maint of new & existing sys + designing new sys. IBM DOS and/or NCR exp ideal. Salary **$25,000**

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Conn multi-div metal processing client seeks indiv to direct internal consulting function to all subs. Prior exp in this environ req. Unique oppty for sr level executive. Starting salary to **$55,000**

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Conn based Fortune 500 industrial oppty to direct instal of multi-div order entry system. Exp with distributive processing using IBM & other mini equip desired. Occasional nat'l trvl. Salary range **$35,000**

**TECH CONSULT/CICS**

Hi-quality fin'l firm in beautiful suburban loc seeks strong communicator with COBOL, CICS & PAN-VALET bkgrd to provide in-house consultation & on-line appl design to all div's. Salary range **$31,300**

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Conn shore oppty for sys eng'r with strong computer graphics & geometric exp to provide analysis & design for major industrial corp. IBM, Univac, DEC hardware. Salary range **$30,000**

**NETWORK PLANNING MGR**

Multi-div Conn client expanding on-line capabilities to remote locations. Indiv with extensive tech & planning resp's with multi-vendor products highly pref. Salary to **$42,000**

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Fortune 500 client seeks 4 yrs systems programming expr in ASSEMBLER & COBOL. Requires thorough knowledge of IBM-OS/MVS internals, JCL, & utilities. VTAM, VSAM, OR NCP helpful. Excellent benefits. Salary **$25-30,000**

**PROG/ANALYST**

State-of-the-art shop seeks 3-5 yrs expr in IBM-OS, strong COBOL, & IMS or other DBMS. Banking or S&L application systems helpful but not required. Career path opportunity. Salary **$19-25,000**

**OPERATIONS/ANALYST**

Progressive client seeks 3-5 yrs DP expr with IBM-OS, JCL, TSO, utilities & procs. Will develop, coordinate & implement systems into production status. Must have project analysis & have good analytical, organization, & communication skills. Solid growth potential. Salary **$18-23,000**

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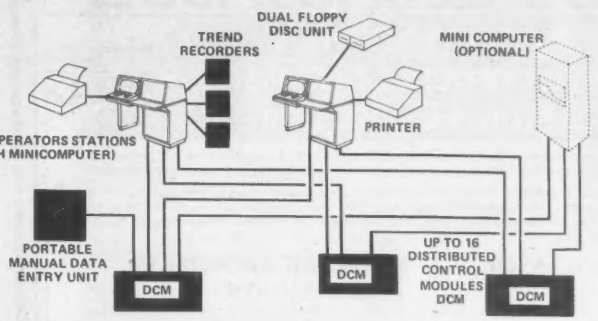

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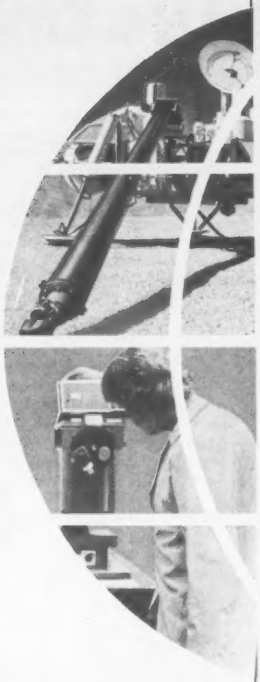
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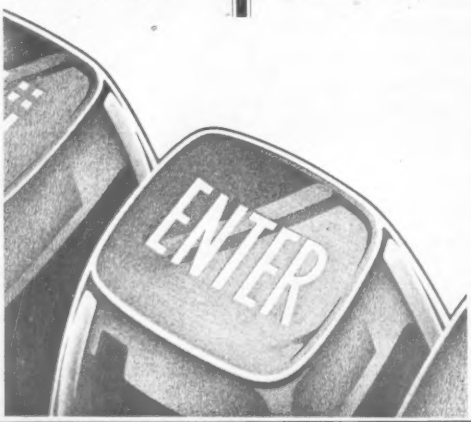
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## DIRECTOR OF DATA RESOURCES AND COMMUNICATION

If you are looking for a challenge, we want to tell you about the opportunity available at ST. ALEXIUS HOSPITAL.

**RESPONSIBILITIES:**
Direct, plan, and coordinate data resources to assure hospital wide data communication program. Top management position reporting directly to the Chief Executive Officer.

**EXPERIENCE:**
8 years of experience, preferably in hospital data processing. Prior experience in cobol and a working knolwedge of the nast/3 language. Master's degree in computer sciences can be substituted for experience.

**EDUCATION:**
Bachelor's degree with a major in computer sciences preferred or an associate degree in mathematics, business, or accounting and several years of hospital data processing experience may be substituted.

**Join us in Bismarck The Capitol of North Dakota**

St. Alexius Hospital, a major hospital in the state, is currently a 259 bed full-service hospital which is expanding to 300 beds. It is one of the oldest hospitals in North Dakota and has the reputation of offering quality patient care. St. Alexius is located in Bismarck, a beautiful, rural community known for it's friendliness and small town living.

For more information, call Wanda Pfaff **(701) 224-7179** or send resume:

**St. Alexius Hospital**
**Box 1650**
**Bismarck, North Dakota 58502**

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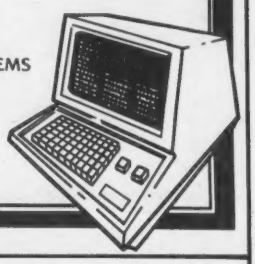
# PROGRAMMERS

We're Station Business Systems, a leader in the field of computerized business systems for the broadcast industry. Expanding activities have created opportunities for Programmers with experience in business application software development on minicomputers. Two or more years Cobol experience, good communications skills, and small project orientation are also essential.

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## Senior Systems Analysts

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- **Minimum 3 to 5 years in large-scale IBM environment**
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We offer excellent salary, benefits package including both Pension and Profit Sharing, and a liberal relocation policy. For immediate consideration, call **(901) 523-5307**; or send your resume, with salary history, in confidence to:

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Cherry Hill, New Jersey 08002
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- **real-time systems programing...**

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If you're ready to make a move FORWARD in your career, then we invite you to talk to us now. For immediate consideration, please forward your resume to **Professional Staffing, Dept. CW-27, Attn: Dave Valdez, 1725 Technology Drive, San Jose, CA 95110.**

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This is an exciting time to come on board: We've just gone on-line, using CICS under OS/VSI under VM/370. We have an IBM 4341 with 3370 and 3350 DASD. And, we're considering a data base management system.

Contact Norma Hoshide at (415) 835-3000, ext. 286.

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**Information Systems/Data Processing**

Beginning Aug. 24, 1981 a one year faculty position split between academic and administrative functions. Teach new curriculum based on DPMA national CIS model and participate in developing computer literacy among college staff. Administrative duties include software evaluation and modification for Burroughs 1855 and micros. In addition to programming skills in Basic and COBOL, a masters degree (DP, Bus. Ed., CS or equivalent) is a minimum requirement. Must be able to work with students and college staff. Experience on B1855, programming skills in Fortran and RPG, experience in Systems Analysis/-Design and/or elective areas of DPMA model are desirable. Salary rank depends on credentials and experience. Send resume, transcripts and three letters of recommendation by July 15, 1981 to: **Dr. Edwin C. Nelson, President, Chadron State College, Chadron, NB 69337.**

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For more details, send your resume or call:

**Mark Fuller**

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# PROGRAMMER ANALYSTS

## COLORADO OPPORTUNITY

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We offer competitive salary, comprehensive benefits with these career opportunities in the choice city of Colorado. For immediate and confidential attention, send your professional qualifications to:

**R. Hendrick**

**TELEDYNE WATER PIK**

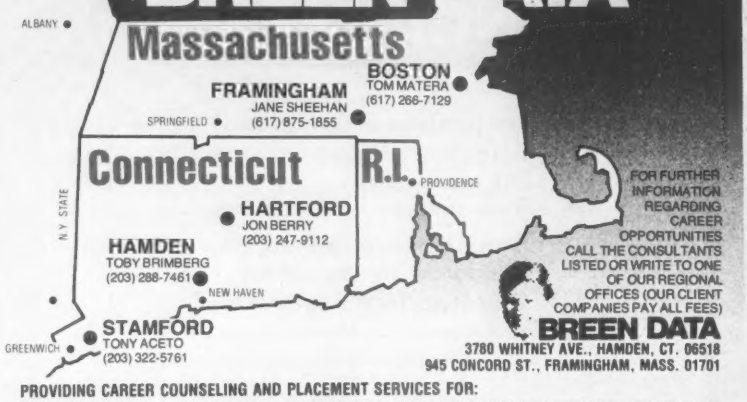
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DATA PROCESSING

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The successful candidate will assume responsibility for the installation, control and maintenance of an OS/VSI computer operating system.

The operating environment is VM/370, DOS/VSE, VS1, system 2000, DL/I, CICS/VS, running on an IBM 3031 and 3033 CPU's.

We offer competitive salary and benefit plans, relocation allowance and high visibility within a challenging and highly demanding environment. For confidential consideration, forward your resume and salary history to:

Ball

J.L. Winslow
Manager, Employee Relations
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**RESPONSIBILITIES:** Writing feasibility reports, business systems analysis, design, program specs, project direction including system implementation as well as writing complete user documents.

**REWARDS:** A key position with a highly respected company. A secure future with salary commensurate with ability, fringe Benefit Package and Profit Sharing Plan.

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**TO APPLY:** Send resume and salary history to our Personnel Director.

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You will translate design specs into computer programs instructions, perform debugging and prepare systems test data and program documentation. You should have 1½ years programming experience in IBM System 34, and be a HS grad or equivalent with some college and technical training. A Degree in Business, knowledge of RPG II and experience in manufacturing applications would be desirable assets.

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### Systems & Programming

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We can offer an excellent salary and benefit package, as well as uncommon growth opportunities. To explore your potential at PRINTRONIX, submit your resume to the address below, or **call JEFF LEVY at 714/549-8272.**

**To learn more about PRINTRONIX and our benefit package, call our 24-hour recorded INFORMATION LINE at 714/546-3886.**

**17421 Derian Ave., Irvine, CA 92714**
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**PRINTRONIX**

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**Data Processing**
**Technical Support Manager**

Brenco Automation Center a wholly owned subsidiary of Brenton Banks Inc., which this year is celebrating its 100th year of service to Iowa, is seeking a qualified experienced individual to head its technical support group.

The responsibilities of this key position includes the generation and maintenance of operating software components (DOS/VS/VSE, CICS, VTAM, NCP, VSAM, etc.), performance measurement and capacity planning and provide technical assistance and training to other staff members.

We offer an excellent salary and fringe benefit package and the opportunity for professional development and growth in a challenging environment. Please forward your resume or call collect: **Mr. J.E. Nevens, President, Brenco Automation Center Inc., 717 Mulberry, Des Moines, Iowa 50309, 515-283-2415.**

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## Systems Consultant

For growing computer software company. Must have two years experience as project manager with demonstrated abilities to handle commercial clients and solve their problems. Minimum high school graduate with four years technical experience. Salary $36,000 per year. Apply:

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Exciting opportunity to provide leadership in conversion from Burroughs B-6800 to IBM 4341. B.S., 5 years experience to include IMS/DB/DC required. U.S.U. offers excellent benefits and is located in a prime recreational area. Send resume, three references, salary requirements by June 19, 1981 to: **F. Burnett, UMC 37, Utah State University, Logan, Utah 84322. AA/EOE.**

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All inquiries are treated in the strictest confidence.

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Data Processing Professionals follow the sun and build a future. There is a demand for: Managers, Systems Programmers, Performance Analysts, and Programmer/Analysts (CICS, IMS) who are highly qualified with a desire for career advancement. Our client companies pay all fees and relocation. For confidential attention please call or send your resume to: **Professionals U.S.A., 2551 State St., Carlsbad, CA 92008. 714/434-2536 or 729-2659.**

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## ARKANSAS TECH UNIVERSITY
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Teach computer and/or management science courses in a degree program similar to DPMA-CIS MODEL business oriented recommendations. Emphasis is teaching. Masters required. Doctorate preferred. Rank and salary dependent upon qualifications. Search reopened until June 30 and thereafter until filled. **Contact: Head, Computer and Management Science Department, Arkansas Tech University, Russellville, Arkansas 72801.**

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COMPUTERWORLD

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As an Engineer-Consultant in our Corporate Engineering Standards and Product Safety department at NCR World Headquarters, you will have wide-ranging responsibilities. You will work with software development and support organizations in order to develop effective software engineering standards for control of the software development process and the assurance of software design integrity.

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Applicants must be skilled in IBM Assembly language and have a minimum of 3 years programming experience. Some data base, data communications and/or systems programming experience very desirable.

**APPLIED DATA RESEARCH** offers a very competitive salary commensurate with your background and potential and a comprehensive benefits package which includes semi-annual bonuses and dental, prescription drug and tuition assistance plans. For more information please forward your resume including salary history, in strict confidence to: Personnel Director

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ADR

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Small 4-year college seeks highly motivated individual to coordinate administrative and academic data processing. RJE and interactive terminals in OS-MVS environment. Should be familiar with VSPC, CICS, ADABAS and be able to generate reports using Easytrieve, ADACOM, and ADASCRIPT. Minimum education and experience: Bachelor's degree or equivalent in business or public administration, with courses in data processing, and at least two years data processing coordinating experience. Send resume to: Loyde G. Peterson, Director of Business Affairs, Mayville State College, Mayville, North Dakota 58257.

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# CSIRO

**RESEARCH SCIENTIST/SENIOR RESEARCH SCIENTIST (RESEARCH FELLOW)**
**DIVISION OF COMPUTING RESEARCH**
**CANBERRA, ACT, AUSTRALIA**

**CSIRO** has a broad charter for research into primary and secondary industry areas. The Organization has approximately 7,400 employees — 2,500 of whom are research and professional scientists — located in Divisions and Sections throughout Australia.

**FIELD:** Open Systems Architecture

**GENERAL:** The Division of Computing Research operates an Australia wide computer network to provide a computing service to CSIRO, Government and other users located throughout the country. Major host computers used by the Division included a CDC Cyber 76, a CDC Cyber 730, a FACOM M190, two FACOM M150s and a Two Pi V32, and services are offered using the CDC operating systems SCOPE 2 and NOS/BE, FACOM OS IV/F4 and IBM VM370/CMS.

The host computers at the Division's Canberra Computer Centre are connected to each other and to the long distance communications network by a local high speed (50 million bits per second) contention network using a Network Systems Corporation's HYPER channel.

The Division is currently undertaking a development project in conjunction with Facom Australia Ltd. aimed at enhancing the existing local network into a general resource sharing system based on the proposed ISO Open Systems Architecture model.

**DUTIES:** The appointee will become a member of the group devoted to resource sharing development and will be expected to play a leading part in defining and implementing the necessary intermachine connection protocols.

**QUALIFICATIONS:** Applicants should possess a PhD or equivalent qualification in computing science or a related field. Proven experience in the field of communications protocols and software is required with special emphasis on X.25 or equivalent packet switched systems. Knowledge and experience with local networks and the ISO Open Systems Architecture model would be highly desirable.

**SALARY:** Research Scientist/Senior Research Scientist: $A17,972-$A26,109pa.

**TENURE:** Initial appointment for three years. Superannuation benefits available.

**APPLICATIONS:** In writing and stating full personal and professional details, the names of at least two referees and quoting reference No. A1942 should reach:

**The Chief**
**Division of Computing Research**
**CSIRO**
**P.O. Box 1800**
**CANBERRA CITY ACT 2601 AUSTRALIA**
**by 26 June 1981.**

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Companies provide challenge, opportunity for advancement, and State-of-the-Art installations. Need the following career specialties: Project Manager(s), Project Leader(s), Systems Analyst(s), Programmer/Analyst(s), System Programmer(s), Programmer(s).

All fees, including interviews and relocation expenses, assumed by client companies.

Please send your resume in confidence to

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**(904) 398-7371**

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## DATA PROCESSING PROFESSIONALS

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(704) 554-8771

# DATA PROCESSING CONSULTANT

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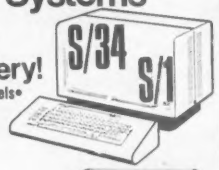
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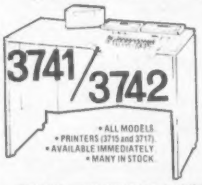
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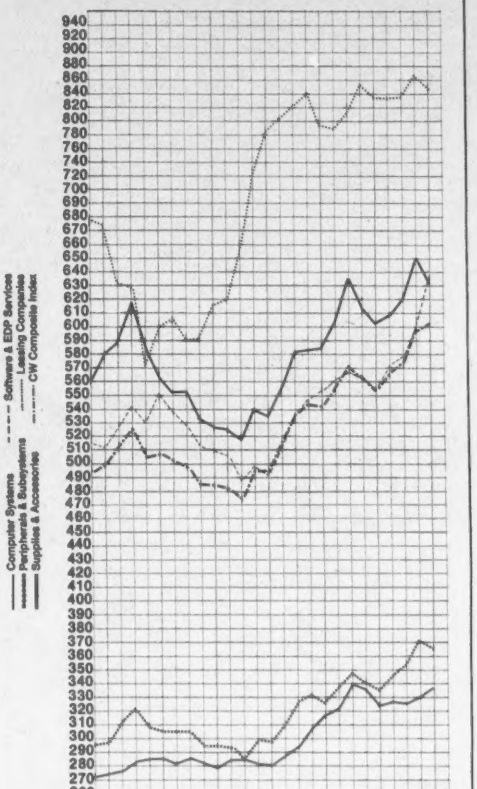
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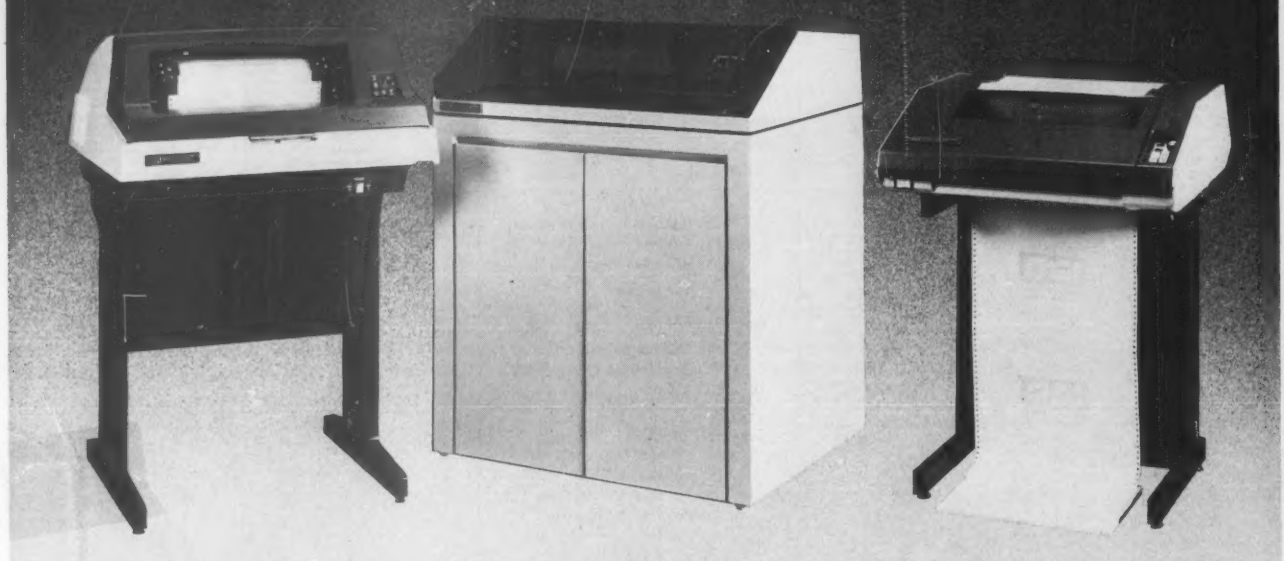
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| N | BURROUGHS CORP | 42- 88 | 43 1/4 | - 1/8 | -0.2 |
| O | COMPUTER AUTOMATION | 8- 27 | 15 1/4 | - 1/2 | -3.1 |
| N | CONTROL DATA CORP | 35- 64 | 61 1/8 | - 7/8 | -1.0 |
| O | CRAY RESEARCH INC | 10- 49 | 40 5/8 | -5 | -10.8 |
| N | DATA GENERAL CORP | 48- 87 | 83 1/8 | -4 3/8 | -8.4 |
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| N | DIGITAL EQUIPMENT | 52-113 | 107 3/4 | -4 5/8 | -4.1 |
| A | EECO INC | 8- 19 | 16 1/4 | - 7/8 | -5.1 |
| N | ELECTRONIC ASSOC. | 8- 12 | 7 1/4 | - 1/8 | -1.8 |
| N | FOUR-PHASE SYSTEMS | 19- 48 | 40 5/8 | -3 3/8 | -7.8 |
| N | FOXBORO | 31- 62 | 53 5/8 | + 7/8 | +1.6 |
| O | GENERAL AUTOMATION | 7- 19 | 14 1/4 | - 1/4 | -1.7 |
| O | GRI COMPUTER CORP | 1- 3 | 1 1/4 | 0 | 0.0 |
| N | HARRIS CORP | 23- 60 | 48 1/2 | -2 3/4 | -5.3 |
| N | HEWLETT-PACKARD CO | 48-107 | 104 1/8 | + 3/8 | +0.3 |
| N | HONEYWELL INC | 65-115 | 80 | -3 7/8 | -4.6 |
| N | IBM | 50- 78 | 59 1/8 | +1 1/4 | +2.1 |
| O | MAGNUSON COMP SYSTS | 20- 46 | 33 1/2 | -1 1/2 | -4.2 |
| N | MANAGEMENT ASSIST | 8- 25 | 14 5/8 | + 1/2 | +3.5 |
| O | MINI-COMPUTER SYST | 1- 6 | 3 3/8 | + 1/4 | +8.0 |
| N | MODULAR COMPUTER SYS | 8- 31 | 18 1/4 | +1 3/8 | +8.8 |
| N | MOHAWK DATA SCI | 10- 31 | 26 | -1 1/2 | -5.4 |
| N | NCR | 52- 82 | 65 3/4 | -1 1/8 | -1.6 |
| N | PRIME COMPUTER INC | 10- 48 | 44 1/4 | -4 3/8 | -8.9 |
| N | PERKIN-ELMER | 13- 35 | 30 1/2 | 0 | 0.0 |
| N | SPERRY CORP | 42- 65 | 51 7/8 | +1 1/2 | +2.9 |
| O | TANDEN COMPUTERS INC | 13-104 | 85 1/4 | -7 1/2 | -7.2 |
| N | TEXAS INSTRUMENTS | 78-130 | 107 1/2 | -11 1/4 | -9.4 |
| A | WANG LABS. | 17- 80 | 36 7/8 | -5 1/8 | -12.2 |
| | **LEASING COMPANIES** | | | | |
| O | BOOTHE FINANCIAL CP | 13- 27 | 25 1/4 | 0 | 0.0 |
| N | COMDISCO INC | 8- 24 | 21 3/4 | + 1/8 | +0.5 |
| A | COMMERCE GROUP CORP | 1- 2 | 1 | 0 | 0.0 |
| A | COMPUTER INVSTRS GRP | 1- 4 | 5/8 | 0 | 0.0 |
| O | CONTINENTAL INFO SYS | 2- 15 | 8 | + 3/4 | +10.3 |
| M | DATRONIC RENTAL | 3- 5 | 4 1/8 | 0 | 0.0 |
| A | DCL INC | 3- 8 | 3 5/8 | + 1/8 | +3.5 |
| N | DPF INC | 5- 12 | 8 | 0 | 0.0 |
| O | ITEL | 1- 15 | 3/4 | - 1/4 | -25.0 |
| O | LEASPAC CORP | 1- 2 | 3/8 | 0 | 0.0 |
| A | PIONEER TEX CORP | 2- 4 | 3 | - 5/8 | -17.2 |
| N | RELIANCE GROUP INC | 24- 84 | 79 1/2 | + 1/2 | +0.6 |
| N | U.S. LEASING | 12- 30 | 27 1/8 | - 3/8 | -1.3 |

| EXCH | | 1980-81 RANGE (1) | CLOSE JUNE 3 1981 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| | **SOFTWARE & EDP SERVICES** | | | | |
| O | ADVANCED COMP TECH | 1- 8 | 5 3/4 | + 3/4 | +15.0 |
| O | ADVANCED SYSTEMS INC | 12- 15 | 12 1/2 | - 1/2 | -3.8 |
| O | ANACOMP INC | 7- 24 | 22 7/8 | + 7/8 | +3.8 |
| O | ANALYSTS INTL CORP | 3- 14 | 8 | 0 | 0.0 |
| A | APPLIED DATA RES. | 8- 24 | 24 1/4 | +3 3/4 | +18.2 |
| N | AUTOMATIC DATA PROC | 15- 32 | 31 3/4 | +2 3/8 | +8.0 |
| O | CDA COMPUTER ASSOC | 8- 17 | 13 | 0 | 0.0 |
| O | COMPUTER HORIZONS | 1- 5 | 3 | - 1/4 | -7.6 |
| O | COMPUTER NETWORK | 4- 9 | 8 1/8 | + 3/4 | +13.8 |
| N | COMPUTER SCIENCES | 11- 30 | 23 5/8 | + 1/8 | +0.5 |
| O | COMPUTER TASK GROUP | 1- 23 | 20 1/2 | +3 1/2 | +20.5 |
| O | COMPUTER USAGE | 2- 10 | 4 | 0 | 0.0 |
| O | COMSHARE | 11- 21 | 14 | 0 | 0.0 |
| O | CULLINANE DATABASE | 18- 69 | 58 1/2 | -5 1/2 | -8.4 |
| O | DATA DIMENSIONS INC | 1- 6 | 1 1/2 | - 1/8 | -7.8 |
| O | DATATAB | 1- 4 | 3 1/2 | +1 1/2 | +75.0 |
| O | DBI CORP | 4- 8 | 6 5/8 | +1 1/4 | +23.2 |
| O | DYATRON CORP | 4- 11 | 9 1/4 | + 1/4 | +2.7 |
| N | ELECTRONIC DATA SYST | 18- 59 | 57 3/4 | +2 | +3.5 |
| O | INFORMATICS INC | 8- 33 | 27 1/4 | - 3/4 | -2.8 |
| O | INSYTE CORP | 1- 3 | 2 1/2 | - 1/4 | -9.0 |
| O | IPS COMPUTER MARKET. | 1- 4 | 1 1/2 | 0 | 0.0 |
| O | KEANE ASSOCIATES | 3- 9 | 7 | + 1/4 | +3.7 |
| O | KEYDATA CORP | 1- 5 | 3/4 | 0 | 0.0 |
| A | LOGICON | 12- 35 | 34 1/4 | +3 7/8 | +12.7 |
| O | MNGT SCI AMER INC | 17- 28 | 24 3/4 | +2 1/2 | +11.2 |
| O | MATHEMATICA INC | 5- 18 | 17 1/4 | +2 | +13.1 |
| O | MATHEMATICAL APP GRP | 7- 33 | 24 1/2 | +2 1/2 | +11.3 |
| O | NATIONAL DATA CORP | 5- 27 | 24 | -2 1/8 | -8.1 |
| N | PLANNING RESEARCH | 5- 13 | 9 5/8 | +1 3/8 | +16.8 |
| O | PROGRAMMING & SYS | 1- 1 | 1 | 0 | 0.0 |
| O | RAPIDATA INC | 4- 11 | 8 7/8 | - 5/8 | -6.5 |
| O | REYNOLDS & REYNOLD | 18- 34 | 22 1/4 | +1 1/2 | +7.2 |
| O | STSC INC | 6- 28 | 23 1/4 | +3 1/4 | +16.2 |
| O | SCIENTIFIC COMPUTERS | 3- 17 | 8 1/2 | - 1/4 | -2.5 |
| N | TYMSHARE INC | 17- 56 | 50 3/4 | + 1/4 | +0.4 |
| A | URS CORP | 5- 17 | 15 5/8 | + 3/8 | +2.4 |
| N | WYLY CORP | 4- 20 | 13 7/8 | +1 5/8 | +13.2 |
| | **PERIPHERALS & SUBSYSTEMS** | | | | |
| N | AM INTERNATIONAL | 11- 24 | 14 5/8 | +1 | +7.3 |
| A | ANDERSON JACOBSON | 8- 25 | 20 1/4 | -1 1/2 | -6.8 |
| O | AUTO-TROL TECHNOLOGY | 18- 62 | 23 3/4 | +1 | +4.3 |
| O | BEEHIVE INT'L | 2- 18 | 15 | - 1/4 | -1.6 |
| A | BOLT,BERANEK & NEW | 8- 28 | 21 | + 1/4 | +1.2 |
| N | BUNKER RAMO | 17- 54 | 53 7/8 | +1 | +1.8 |
| O | CAMBEX CORP | 1- 8 | 7 1/2 | - 3/4 | -9.0 |
| N | CENTRONICS DATA COMP | 11- 55 | 13 3/8 | -1 7/8 | -12.2 |
| A | CETEC CORP | 3- 8 | 7 | 0 | 0.0 |
| O | COMPUTER DEVICES INC | 5- 10 | 8 1/4 | + 3/8 | +4.7 |
| O | COGNITRONICS | 1- 11 | 8 5/8 | + 1/4 | +2.6 |
| O | COMPUTER COMMUN. | 2- 10 | 2 3/8 | - 1/4 | -8.3 |
| O | COMPUTER CONSOLES | 4- 37 | 33 | -1 3/4 | -5.0 |
| O | COMPUTER TRANSCEIVER | 1- 7 | 6 3/4 | - 1/8 | -1.8 |
| N | COMPUTERVISION CORP | 24- 85 | 66 3/8 | -8 3/8 | -8.8 |
| N | CONRAC CORP | 13- 28 | 26 | +1 | +4.0 |

| EXCH | | 1980-81 RANGE (1) | CLOSE JUNE 3 1981 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| A | DATA ACCESS SYSTEMS | 8- 20 | 12 7/8 | -1 3/8 | -9.6 |
| A | DATAPRODUCTS CORP | 11- 44 | 32 | -2 3/8 | -6.8 |
| O | DATUM INC | 2- 8 | 2 7/8 | - 1/4 | -8.0 |
| O | DECISION DATA COMPUT | 2- 8 | 4 | - 3/8 | -8.5 |
| O | DELTA DATA SYSTEMS | 1- 4 | 4 1/4 | +1 1/8 | +36.0 |
| O | DATARAM CORP | 6- 37 | 8 1/8 | 0 | 0.0 |
| N | ELECTRONIC M & R | 3- 8 | 5 1/4 | - 1/8 | -2.3 |
| O | EVANS & SUTHERLAND | 21-117 | 101 | -14 1/2 | -12.5 |
| O | FABRI-TEK | 1- 6 | 5 3/4 | + 1/8 | +2.2 |
| O | GENERAL COMPUTER SYS | 1- 12 | 8 1/2 | - 1/4 | -2.8 |
| O | GEN'L DATA COMM IND | 8- 22 | 15 5/8 | -1 1/4 | -7.4 |
| O | GENERAL TERMINAL CP | 1- 4 | 1 1/8 | - 1/8 | -10.0 |
| N | HAZELTINE CORP | 12- 33 | 23 | 0 | 0.0 |
| O | INFORMATION INTL INC | 8- 15 | 13 3/4 | +2 | +17.0 |
| O | INTEL CORP | 23- 50 | 38 | -3 | -7.3 |
| A | LUNDY ELECTRONICS | 4- 17 | 12 | 0 | 0.0 |
| O | MBI DATA CORP | 5- 25 | 25 | +2 | +8.8 |
| N | MEMOREX | 10- 34 | 12 1/4 | - 1/8 | -1.0 |
| O | NETWORK SYSTEMS CORP | 14- 25 | 23 | + 1/8 | +0.5 |
| O | OMEX | 2- 12 | 12 | 0 | 0.0 |
| A | PARADYNE CORP | 8- 50 | 44 5/8 | -4 7/8 | -9.8 |
| A | PENRIL CORP | 8- 17 | 14 1/2 | - 1/2 | -3.3 |
| O | RAMTEK CORP | 10- 23 | 14 7/8 | - 3/4 | -4.7 |
| O | RECOGNITION EQUIP | 5- 21 | 13 3/8 | +1 | +8.0 |
| O | SCAN DATA | 1- 5 | 2 1/8 | - | -2.8 |
| N | STORAGE TECHNOLOGY | 12- 35 | 33 1/2 | -1 3/4 | -4.8 |
| O | SYKES DATATRONICS | 14- 75 | 61 1/4 | -13 1/4 | -17.7 |
| O | T BAR INC | 14- 24 | 18 1/2 | + 3/4 | +4.2 |
| A | TEC INC | 3- 8 | 5 3/8 | + 3/8 | +7.5 |
| N | TEKTRONIX INC | 42- 70 | 60 1/4 | + 1/4 | +0.4 |
| N | TELEX | 3- 8 | 8 3/4 | - 3/8 | -4.1 |
| O | TESDATA SYSTEMS CP | 8- 28 | 8 7/8 | - 1/8 | -1.2 |
| A | TIMEPLEX INC | 5- 22 | 18 5/8 | + 5/8 | +3.8 |
| O | WILTEK INC | 1- 3 | 2 7/8 | 0 | 0.0 |
| | **SUPPLIES & ACCESSORIES** | | | | |
| A | AMERICAN BUS PRODS | 8- 18 | 15 5/8 | 0 | 0.0 |
| O | BALTIMORE BUS FORMS | 1- 2 | 1 1/4 | 0 | 0.0 |
| N | BARRY WRIGHT | 8- 22 | 18 1/2 | - 3/8 | -1.8 |
| O | CYBERNETICS INC | 1- 2 | 1 1/8 | 0 | 0.0 |
| A | DUPLEX PRODUCTS INC | 11- 18 | 14 3/4 | - 1/8 | -0.8 |
| N | ENNIS BUS. FORMS | 13- 21 | 18 | + 5/8 | +3.4 |
| N | 3M COMPANY | 48- 85 | 57 3/8 | + 1/4 | +0.4 |
| O | MOORE CORP LTD | 27- 38 | 35 7/8 | - 5/8 | -1.7 |
| N | NASHUA CORP | 20- 35 | 22 3/4 | -1 1/8 | -4.7 |
| O | STANDARD REGISTER | 22- 35 | 33 1/4 | 0 | 0.0 |
| A | TAB PRODUCTS CO | 8- 30 | 25 1/4 | +2 3/8 | +10.3 |
| N | WALLACE BUS FORMS | 12- 29 | 28 3/8 | +5 | +21.3 |

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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